

MARIE HAMMER

ORIBATIDS FROM TONGATAPU
AND EUA, THE TONGA ISLANDS,
AND FROM UPOLU, WESTERN
SAMOA

Det Kongelige Danske Videnskabernes Selskab
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Synopsis

In the present investigation of Tongatapu, Eua and Upolu a total of 124 species was found, of which 54 are new to the science. 15 new genera were established. The species found were distributed with 73 on Tongatapu, 40 on Eua, and 58 on Upolu. 28 species are common to the Tonga Islands and West Samoa. Furthermore 15 of these are known from Viti Levu, the Fiji Islands, and 23 from Tahiti. The relationship between the different islands is, however, more far-reaching since Fiji has 32 species common with the Tonga Islands/West Samoa, and Tahiti 45 species in common with these islands. From the table (p. 00) it appears that species common to Fiji, the Tonga Islands, West Samoa and Tahiti compose a solid core of Oceanic species, which has offshoots to many parts of the Pacific area and outside this. These species common to Fiji, Tonga, West Samoa and Tahiti comprise c. 60% of the total number of species of each individual island (graphical display p. 63). The species which New Zealand has in common with Oceania comprise only 5% of the oribatid fauna of New Zealand. This seems to confirm that affinity with New Zealand's oribatid fauna should be sought in the sub-Arctic islands and in South America.

Preface

The material, which forms the basis of the present treatise, was collected during a very short space of time in the autumn of 1969, when a sudden impulse on my way to Tahiti (HAMMER 1972) made me stop at the Tonga Islands and in West Samoa. Even a short period of a week could give a picture of the oribatid fauna in this part of the Pacific area and perhaps clarify certain problems regarding distribution. While on Tongatapu the airport authorities forced me, in spite of a reservation, to prolong my stay by a further week, which gave me the opportunity of collecting a couple of samples from Eua, the Tonga Islands.

I should like to offer my most grateful thanks to the Carlsberg Foundation, and to the Danish Research Foundation, who paid travelling and other expenses for me and my assistant, cand. scient. BIRGITTE HAMMER. Furthermore the Carlsberg Foundation covered my expenses during the preparation of the collected material, while the Danish Research Foundation paid the translation.

I owe an immense debt of gratitude to the Royal Danish Academy of Sciences and Letters, who have undertaken the publication of my many papers on the distribution of the oribatids in the southern hemisphere.

Mrs. JENNIFER DUPUIS-STARCKE has undertaken the translation of part of the manuscript and assisted me with a revision of the remainder. For this I thank her most cordially.

Fredensborg, December 1972.

MARIE HAMMER

Introduction

The investigation of the oribatid fauna of New Zealand (HAMMER 1966–68) with its many, apparently endemic species and genera left many problems. Has this fauna developed in New Zealand after the isolation of this country by continental drift, and is it limited to this area, i.e. is it a counterpart to the peculiar fauna of the Galapagos Islands?

For a closer elucidation of the problem, investigations were demanded of the closest lying areas of land. The investigation of the oribatid fauna of the Fiji Islands (HAMMER 1971) did not solve the problem, since not one of the families hitherto endemic to New Zealand was found.

Thus in 1969, on my way to Tahiti, I collected oribatids on Tongatapu, the Tonga Islands, and immediately after made collections for a week on Upolu, West Samoa. Both in climatic as well as geological and vegetation conditions these two islands are very different from each other, factors that can be of significance for the composition of the fauna.

Tongatapu, lying within the Australian mainland's continental shelf, longitude c. 175° west, latitude c. 22° south, is a low coral island, which apart from a single hill hardly rises more than a few metres above sea level. The porous coral sand, that allows rain water to seep through, gives the impression that the island is dry in spite of the large amount of precipitation (normal precipitation 1946 mm). Where the chalk has disintegrated the island is fertile with coco-palms rising above breadfruit trees, bananas, mango, papaya, etc., and with a dense undergrowth of numerous varieties of vegetable and root crops such as kasawa, sweet potato, maize, tomato, taro, etc. The original vegetation is found nearly exclusively along the coasts.

Apart from on Tongatapu, a few samples were taken on Eua, south-east of Tongatapu. This island is separated from Tongatapu by a deep sea channel. The lack of time and the difficult navigational conditions, the boat returning immediately after unloading, made collecting almost impossible. Eua is mountainous and covered in forests.

Upolu, West Samoa—latitude c. 171° west, longitude c. 14° south—is volcanic, but surrounded by coral reef. It is mountainous with peaks up to 1100 m. The precipitation is significantly greater than on Tongatapu (normal precipitation 2884 mm). Compared with Tongatapu, Upolu is far less cultivated. In the mountains there are still great forests where the mist hangs densely over the large trees heavily covered in moss and lichens. Collecting was limited to a series of samples taken along the road that travels south from Apia through the forest over the mountain to Afiamalu lying at a height of c. 700 m. In addition, a few samples were taken in the town of Apia.

Descriptions of the Biotopes

Tongatapu Island. 20 Nov., 1969.

No. 26. About 2 miles west of Nukualofa; moist mouldering leaves (coco-palm(?)).

- 27. Idem; wet remnants of coco-palm leaves.
- 28. Idem; dry remnants of leaves of deciduous tree.
- 29. Idem; road-side, grass on dry soil.
- 30. Close to the preceding samples, dry leaves of deciduous tree.
- 31. Near Fatai; *Usnea barbata*(?) on deciduous tree.
- 32. Idem; dry bark on the same tree as 31.
- 33. Near Tofoa south-west of Nukualofa; fresh grass at the lagoon.
- 34. Idem; moist litter under mangrove.
- 35. Idem; moist sea-weed washed ashore.
- 36. Idem; slightly moist litter under mangrove.
- 37. At Captain Cook's tree in the eastern part of the lagoon, moist, rotten wood.
- 38. Idem; slightly moist litter under mangrove.
- 39. Between Captain Cook's tree and the north-eastern coast, dry grass from a tussock.
- 40. Idem; lichens and dry grass under a banana.
- 41. Idem; thin cover of very dry moss on the lower part of a coco-palm.
- 42. Idem; dry *Polyporus* on a dead trunk, in a coco-palm plantation.
- 43. Idem; dry loose bark on a dead trunk, housing ants.
- 44. At Ha'amonga; slightly moist litter in a one metre deep hole in the coral cliff on the shore.
- 45-46. Southern outskirts of Nukualofa, luxurious grass and *Cyperus* on black, moist soil.
- 47. 27 Nov.; Nukualofa, dry grass on the road-side.
- 48. Idem; dry low plants on the road-side.
- 49-50. Idem; dry grass and low plants on the road-side.

Eua Island. 28 Nov.

No. 51. Luxurious moss on the bark of a tree, taken about half a metre above the soil.

- 52. Moist litter in the wood.

Tongatapu Island. 3 Dec.

- No. 53. At Ha'atafu on the north-western corner of the island, dry mouldering litter under a dense, low bush.
- 54. Idem; dry litter.
 - 55. At Neiafu, a little south of Ha'atafu; mouldering litter under a breadfruit tree.

Upolu Island, West Samoa. 8 Dec.

- No. 56-78. Collected along the road leading south from Apia halfway over the mountain, mostly through old forest, reaching to about 700 m.a.s.l.
- 56. *Cyperus* bitten off by cows on the road-side, a few hundred metres above sea level.
 - 57. Moist leaves under a tree.
 - 58. Moist luxurious moss and liverworts on bark of a dead tree trunk, under shrubs.
 - 59. Moist moss on a stone fence.
 - 60. Idem; dry moss on a Hibiscus trunk.
 - 61-62. At Afiamalu, the highest point reached.
 - 61. Dry moss and liverworts on a tree trunk, one and a half metre above the ground.
 - 62. Moist moss on roots and stumps, half a metre above the ground.
 - 63-78. In the mountains north of Afiamalu returning to Apia.
 - 63. Moist luxurious moss, one and a half metre above the road on a bank.
 - 64. Idem; moist dead leaves.
 - 65. Idem; moist dead leaves under the overhanging bank, shaded.
 - 66. Idem; almost dry moss, more exposed to the sun, one metre above the ground.
 - 67. Moist soil with moss, shaded by a rock.
 - 68. Slightly moist moss on stony ground on the slope, shaded.
 - 69. Dead moist grass leaves under fresh green grass on an overhanging bank.
 - 70. Moist mouldering branches under a dead tree.
 - 71. Idem; almost dry, mouldering twigs.
 - 72. Slightly moist moss on a dead tree trunk.
 - 73. Fresh fungus on a dead tree trunk.
 - 74. Moist mouldering wood and a little moss on a thick stump.
 - 75. The lowest part of a moist, mouldering fallen tree trunk.
 - 76. *Polytrichum* on the upper side of the same trunk, almost mould, moist-wet.
 - 77. Moss in running water, taken from a stone in a brook.
 - 78. Idem; moss on a stone, about 15 cm above the water.
 - 79-80. Apia; clover and grass on the road-side.
 - 81. On the north coast, a little east of Apia; dead, moist-wet, large leaves at the foot of a tall slope with trees.

List and Descriptions of the Species Found

To avoid the many repetitions of descriptions of biotopes under the discussion of the different species, the samples (biotopes) are in the following indicated by number, while the number of individuals found in each sample is given in brackets.

Hypochthoniidae

Malacoangelia remigera Berl., 1913.
56(5), 80(1).

Sphaerochthoniidae

Sphaerochthonius splendidus Berl., 1910.
37(29).

Brachychthoniidae

Liochthonius oceanicus n.sp.; fig. 1.
Colour yellow. Length about 0.19 mm.

The two specimens found have much in common with *Liochthonius hystericinus* (Forssl.), 1942, and *L. hystericinus* var. *tuxeni* (Forssl.), 1957, (the variety differing from the main form by its shorter notogastral hairs). *L. oceanicus* has shorter notogastral hairs than both *L. hystericinus* and its variety. Thus c1 does not nearly reach d1, d1 not e1, and e1 not f1. Furthermore the distance between the different pairs of hairs differs from that of the two former. C1-c1 is the same as d1-d1. In *L. hystericinus* var. *tuxeni* c1-c1 is one and a half times longer than d1-d1. In *L. oceanicus* d2 is located near the lateral border, in *L. hystericinus* var. *tuxeni* between the border and d1, i.e. more medially. F1-f1, is almost equal to f1-f2, in *L. hystericinus* var. *tuxeni* f1-f1 is not much more than half as long as f1-f2.

The lamellar hairs are directed forwards, in *L. hystericinus* and its variety they bend backwards.
57(2).

Brachychthonius pacificus n.sp.; fig. 2.
Colour yellow-brown. Length about 0.175 mm.

The ridges in the anterior part of the propodosoma are very distinct. There is a semilunar ridge between the rostral hairs. Behind this two curved ridges run laterally,

then turn sharply medially reaching a strong transverse ridge, which has a forwards directed tip at the middle. The transverse ridge, composed of several short ridges, reaches the pseudostigmata laterally. The rostral hairs, located at either end of the semilunar ridge, are rather strong and directed medially. The lamellar hairs, situated immediately behind the anterior part of the transverse ridge, are indiscernible. Behind the lamellar hairs there is a faint pattern consisting of two oblong spots and some backwards-directed lines, while between the interlamellar hairs there is a row of broad greyish spots, of which the anterior one is more or less round, those behind it broader. The interlamellar hairs, located off the middle spot, are as long as the exopseudostigmatic hairs and much thinner than the rostral hairs. The pseudostigmatic organs have a long narrow head with scattered barbs.

The hysterosoma is only a little broader than the propodosoma. The sculpture is very simple consisting of broad greyish spots in the middle of the dorsum, laterally of huge spots with a distinct, slightly dentate medial border forming large broad lobes. The posterior end of the hysterosoma is almost straight apart from the broad processes at its middle carrying the hairs ps1. The setae of the hysterosoma are rather short, strong, and may be hairy. Two small pores can be seen in Segment I.

This species is apparently closely related to *B. immaculatus* Forssl., 1942, and *B. similis* HAMMER, 1961, from both of which it can be distinguished by its two strong posterior processes and by a different pattern both of the propodosoma and of the hysterosoma.

80(1).

Phthiracaridae

Phthiracarus hamatus n.sp.; fig. 3.

Length of notogaster about 0.29 mm. Height of notogaster about 0.20 mm. Length of aspis about 0.15 mm. Colour dirty, light brown.

The rostral hairs are short and stiff; they are separated by a distance a little shorter than their length. The lamellar hairs are very long, ending in a thickening, which bends slightly backwards like a hook (hence the specific name). They are directed forwards. The interlamellar hairs are short and thin, decumbent. Across the aspis there is a brown transverse band, broadest medially and laterally reaching the pseudostigmata. In front of this band the integument is a greyish colour and pitted. Some pits, but more indistinct, can be seen behind the band. Further posteriorly the integument is punctate. A dorsal crest is present. A large oval field with dark anterior border is located between the pseudostigmata. Faint pits can be seen within this oval. The pseudostigmatic organs are hardly discernible in a lateral view, fig. 3a; in a ventral view, fig. 3b, they appear like thin bristles, but in a dorsal view they are hyaline, round disks. A scale from above covers the entrance to the pseudostigma.

The notogastral hairs are hook-shaped like the lamellar hairs. They are of very different lengths, c3 and c2 being especially long, c3 as long as the lamellar hairs. They are directed forwards. Behind the insertion of the hairs is seen a semicircular hole, at the bottom of which the hair is fastened, fig. 3c.

The ventral side is shown in fig. 3b. There are four pairs of short thin genital hairs, the exact shape of which I am unable to determine. Along the medial border of the anal plates there are two thin, knee-bent hairs directed forwards. Behind them, but removed a little more from the medial border, there is a long hair directed forwards of the shape of hair found on the dorsum. Further anteriorly and more laterally two similar hairs are located, the middle one of the three hairs being the longest. The ventral border surrounding the ano-genital region is tongued, ps1-ps3 being each situated in one of these tongues.

32(1).

Hoplophthiracarus siamensis Aoki, 1965.

38(2), 50(1), 52(1).

Hoplophorella scapellata Aoki, 1965.

50(1), 80(7).

Hoplophorella glauca Hammer, 1972.

36(2).

Euphthiracaridae

Rhysotritia ardua (C. L. Koch), var. *otaheitensis* Hammer, 1972.

39(2).

Austrotritia lebronneci Jacot, 1934.

51(3), 64(1).

Epilohmanniidae

Epilohmannia pallida Wallw. subsp. *pacifica* Aoki, 1965a.

30(1).

Lohmanniidae

Papillacarus hirsutus (Aoki), 1961.

29(1).

Meristacarus tahitiensis Hammer, 1972.

36(1).

Tongacarus n.gen.

The body is dorsoventrally flattened, the posterior part of the propodosoma being as broad as the anterior part of the hysterosoma. The latter is shield-shaped, its lateral borders smooth as far as f2. 16 pairs of notogastral hairs. Fossulae vittiformes transversales present. No areae porosae on the dorsum. No dorsal neotrichy. Genital-

plates without transversal suture, hair formula 4 + 3. Preanal plate broad. Anal and adanal plates fused, hair formula 0 + 4. Infracapitulum with 4 pairs of setae. According to BALOGH, 1965, most of these features place it within *Javacarus*. The presence of 4 genital hairs only, 4 pairs of hairs on the infracapitulum, the lack of areae porosae in fossulae vittiformes and its shield-shaped hysterosoma make a new combination: *Tongacarus*.

Tongacarus marginatus n.sp.; fig. 4.

Colour yellow. Length about 0.63 mm.

Rostrum without incision. The lateral border of the propodosoma is angular a short distance in front of the anterior exopseudostigmatic hair. The rostral hairs, which are inserted close together, are longer than the lamellar hairs and apparently smooth along the borders, whereas the lamellar hairs are rough. The interlamellar hairs and the posterior exopseudostigmatic hairs are slightly dentate, the anterior exopseudostigmatic hairs smooth. The pseudostigmatic organs have about 12–15 thin branches. The cerotegument of the propodosoma is decorated with refractive round papillae of different sizes and arranged irregularly, the largest ones being found in the well defined space between the interlamellar and the lamellar hairs. On the rostrum they are much smaller. There is a fine punctation between the refractive tubercles.

The hysterosoma is shield-shaped, broadest at its anterior border and tapering towards the truncate posterior end. The lateral margins are smooth as far as f2 (hence the specific name). Along these smooth borders there is a transparent yellow edge without any sculpture or tubercles. Behind f2 the border is rough, being covered with round papillae. There is a small indentation immediately behind f2. All the notogastral hairs are long, slender, and foliate like those of the prodorsum. They are a little narrower at the base and have a middle-rib, which can be seen only from the surface, not in profile. Some of the hairs are dentate; this is especially the case with e2 and ps1. Apart from the shorter e2, the hairs are approximately of the same length. The sculpture of the integument consists of small round papillae of the same size as those in the middle field of the propodosoma. The fossulae vittiformes transversales are distinct, most of them running unbroken across the dorsum.

The ventral side, fig. 4a. The infracapitulum has four pairs of hairs, of which the lateral ones are very long, foliate. The epimeric hair formula is 3:1:3:4. On Epimer III the two lateral hairs, 3b and 3c, are knee-bent and barbed. The posterior border of Epimer II is straight. The genital field is round and only one third as long as the anal field. There are four aggenital hairs of which the second one is shorter than the others (on the right side in fig. 4a there are only three aggenital hairs). There are four genital hairs, much thinner than the aggenital hairs. The preanal plate is broad and apparently more or less fused with the anal plates, its posterior border being distinct only at the middle, fig. 4b. The anal and adanal plates are fused. There are four long, foliate adanal hairs, of which the posterior one is dentate and broader than the others. Anal hairs are absent. The lateral border along the genital-anal plates

seems to be attached to a triangular lobe, projecting between the genital and the anal plates (see sketch, fig. 4b), which at the same time is attached to the preanal plate immediately behind the triangular lobe. Off f2, i.e. where the smooth lateral border stops, a keel runs obliquely forwards on the ventral side. Monodactylous. 36(1).

Annectacarus unilateralis n.sp.; fig. 5.

Colour light brown. Length about 0.51 mm.

Apparently the specific characteristics of *Annectacarus* are the length and shape of two groups of hairs, viz. c2, d2, and f1 and b1, b2, b3, apart from which the species are very similar. These hairs have been arranged in the table below with c2, d2 in the first column, then f1, followed by b1, b2, and b3. C1, d1, and e1 are alike in the species mentioned, being short and smooth.

	c2, d2	f1	b1, b2, b3
<i>A. mucronatus</i> Grdjn., 1950	smooth longer than c1, d1, e1	smooth, short like c1, d1, e1	short, barbed
<i>A. insculptus</i> Wallw., 1962	moderately long, barbed	like c2, d2	like c2, d2, f1
<i>A. sejugatus</i> Wallw., 1962	moderately long, barbed	like c2, d2	short, smooth
<i>A. unilateralis</i> n.sp.	moderately long, barbed	like c2, d2	shorter than c2, d2, f1, b4 present

According to this table *A. mucronatus* can be distinguished by its short and thin f1, *A. sejugatus* by b1, b2, and b3 being short and smooth. *A. insculptus* has moderately long b1, b2, and b3, viz. as long as c2, d2, and f1. In *A. unilateralis* b1, b2, b3 and b4 are shorter and especially much thinner than c2, d2, and f1. *A. unilateralis* can thus easily be distinguished from *A. insculptus*. Moreover, the marginal notogastral hairs in *A. unilateralis* are unilaterally barbed or fringed (hence the specific name), while those of *A. insculptus* are bilaterally barbed. Of fossulae vittiformes transversales only short and indistinct bands can be seen laterally.

The ventral side, fig. 5a (shown on a larger scale than the dorsal side). The infracapitulum bears 4 pairs of setae of which the anterior one, a, is smooth, the others h, m1, and m2 are barbed and thick. Neotrichy is found on coxisterna I and II, not on III and IV. The hair formula is 6:4:3:4. The paraxial hairs are short and smooth, 1a, 2a, 3a are specially short, whereas 4a is a little longer, and apparently finely barbed. The genital field bears 10 pairs of barbed hairs (on the left side in fig. 5a there are only 9 hairs). The four lateral pairs are longer than the 6 medial ones. The preanal

plate is narrow with parallel sides. The adanal and the anal plates are fused, but a different structure on the two halves shows the original plates, the adanal plates being punctate, the anal plates smooth. Hair formula 4:2. The adanal hairs are long and unilaterally fringed, the tip often bent. The anal hairs are thinner and shorter, apparently bilaterally fringed. The fissures ia, ih, and ip are long and very distinct, ips indistinct. Some parts of the integument are densely punctate, others wrinkled. 36(1), 37(8).

Neotrichacarus n.gen.

The present genus differs from the so far established genera. It is closely related to *Heptacarus* Piffil, 1963, by having notoneotrichy, i.e. 4 pairs of c and 3 pairs of d hairs, on the notogaster and 7 pairs of ano-adanal hairs. It can be distinguished from *Heptacarus* by also having pygidial neotrichy, which is a new combination. There are only two pairs of hairs on the infracapitulum, *Heptacarus* has 4 pairs.

Neotrichacarus plumosus n.sp.; fig. 6.

Colour light brown. Length about 0.54 mm.

The rostral hairs are rather thin and finely barbed. The lamellar and the interlamellar hairs are thick, densely barbed. The anterior exopseudostigmatic hairs are long, thin, and barbed, the posterior exopseudostigmatic hairs are about half as long, thick, like spines, and barbed. The pseudostigmatic organs have about 20 almost equally long secondary branches, the proximal ones being a little shorter. On the posterior border of the organs there are short ciliates. The sculpture of the integument consists of very small, light, shallow pits, like hammered metal.

The hysterosoma has parallel sides; the posterior end is rounded although truncate in front of the projecting ano-adanal plates. Two fossulae vittiformes transversales can be seen in the anterior part of the dorsum, cutting in from the lateral borders. Areae porosae dorsales absent. The notogastral hairs are feathered and of slightly different lengths, the anterior dorsal ones being a little shorter than the posterior ones. Some of the marginal hairs are a little longer, i.e. c4, cp, e2, and some further posteriorly. Due to the pygidial neotrichy it is difficult to see which are the ordinary hairs and which the extra ones. In fig. 6 all the hairs are shown on the left side.

The ventral side, fig. 6a. There is no sternal neotrichy, the epimeric hair formula being 3:1:3:4. All the hairs are feathered. The genital and the aggenital plates are fused and have a transverse suture, on either side of which there are five feathered hairs, i.e. three medial and two lateral ones. The preanal plate is as broad as the posterior border of the fused genital-aggenital plates. The anal plates are fused with the adanal plates along a very indistinct line. These plates are longer than the genital-aggenital plates. On each plate there are 7 hairs of which the five adanal hairs are much longer than the anal hairs. All are feathered. The pygidial neotrichy can also be seen on the ventral side. The infracapitulum bears only two pairs of setae, a and h.

80(31).

Hermanniiidae

Phyllhermannia pacifica Hammer, 1971.

30(1), 37(5), 51(6).

Nothridae

Nothrus oceanicus Selln., 1959.

52(15), 56(5), 79(1).

Allonothrus schuilingi van der Hammen, 1953.

26(4), 56(75), 77(1), 80(180).

Allonothrus russeolus Wallw. var. *reticulatus* Hammer, 1972.

47(5), 48(15), 50(260), 56(2), 69(3), 80(12).

Trhypochthoniidae

Trhypochthonius excavatus (Willm.), 1919.

77(4).

Archegozetes magnus (Selln.), 1925.

38(13), 52(2).

Malaconothridae

Malaconothrus hexasetosus Hammer, 1972.

34(2), 36(2), 66(1).

Malaconothrus cornutus n.sp.; fig. 7.

Colour white-yellowish. Length about 0.37 mm.

The anterior part of the propodosoma is very narrow compared to the posterior part. The rostrum is rounded. The rostral hairs, located almost on the anterior border of the rostrum, are longer than their mutual distance. They are strong, smooth, and bent like horns (hence the specific name). The lamellar hairs are as long as the rostral hairs, but a little thinner. They are situated on the anterior end of the lamellae. The latter are very narrow in their posterior part, and also rather narrow near the base of the lamellar hairs. The exopseudostigmatic hair is moderately long and thin. The interlamellar hair is stronger, but not longer. All the hairs are smooth. The projection between Leg I and II is strong. The middle field of the propodosoma is whitish and densely punctate.

The anterior border of the hysterosoma is almost straight, the latero-anterior corner pointed. The sides are parallel and straight as far as e2, behind which there is a small indentation. Off h2, h3 there is a small tubercle followed by an incurvation. The posterior end is rounded. There are two narrow dorsal ribs, besides those running

laterally and posteriorly from h1. The hairs are arranged as shown in fig. 7. All hairs are smooth and equally long, apart from e2, which is longer and undulating. The distances c1-c1, d1-d1, and e1-e1 are approximately the same. C1-d1 is a little shorter than c1-c1. H1 is situated at the corner where the dorsal rib is divided into two, running laterally and medially. The integument is smooth.

The ventral side, fig. 7a. The epimeric hair formula is 3:1:3:3. The hairs 3b and 3c are much stronger than the rest. There are five pairs of genital hairs and three pairs of adanal hairs, all long, grey, broad, soft-looking, and without distinct contours. Anal hairs are absent. The border behind the anal-adanal plates is very distinct, forming an arch which reaches the posterior border of the hysterosoma. Ps3, ps2, and h3 are situated on a transverse line.

56(2), 80(60).

Nanhermanniidae

Masthermannia mammillaris (Berl.), 1904.

52(4), 56(6.)

Hermannelliidae

Hermannella punctulata Berl. var. *columbiana* Berl., 1910.

36(3), 37(37), 38(43), 44(3), 51(1), 52(2).

Hermannella punctulata Berl. var. *columbiana* Berl., 1910.

36(3), 37(37), 38(43), 44(3), 51(1), 52(2).

Plasmobates aculirostrum n.sp.; fig. 8.

Colour light brown. Length about 0.36 mm.

The rostrum is very pointed ending in a tip, which is the anterior end of a dorsal keel. The latter reaches a triangular hole in front of a transverse ridge. The rostral hairs, situated on strong apophyses, are sickle-shaped, strong, and slightly rough. They are bent medially. The tiny lamellar hairs are situated laterally at a good distance behind the rostral hairs. Interlamellar hairs are absent, the pores dark and distinct, located near the pseudostigmata. The middle of the propodosoma is surrounded by strong ridges. There are irregular light pits along the lateral ridges and very faint pits at the middle of the propodosoma. Two pairs of longish spots are located behind the pseudostigmata. From these very faint dark shadows or folds proceed obliquely forwards and between them there are similar transverse shadows. The pseudostigmatic organs are longer than their mutual distance, thread-shaped apart from the slightly thicker end.

The hysterosoma is as long as it is broad. On the posterior border there are two very low rounded protuberances, laterally to which two hairs are situated at a short distance from the posterior border. A third hair is located in front of the lateral tube. The tubes are narrow and directed forwards. Behind the anterior border there is an

irregular ridge in which 8-shaped holes can be seen. Behind this ridge there is a row of irregular holes surrounded by dark borders. On either side of the dorsum there are three much larger light holes without well defined borders, and laterally there are several small bright pores.

The ventral side, fig. 8a, showing only the middle of the ventral side. Apodemata II are straight and distinct, whereas the sejugal apodemata are hidden under a complicated structure of ridges. Most conspicuous is a curved ridge opening forwards in front of the genital field. Across Epimer II there is a less defined broad, curved, dark ridge opening medially, which is almost a continuation of the curved ridge in front of the genital field. There are six pairs of genital hair pores, the hairs being absent or indiscernible. The short and thick aggenital hairs are situated laterally to the genital field. There are two pairs of anal hairs and three pairs of adanal hairs, all short and thick. Laterally to the anal field there are several small tubercles. On the posterior border of the hysterosoma there are four short apophyses in pairs close together, but only one hair was observed. Further laterally there are two short thick hairs on either side.

69(2).

Lioididae

Liodes bataviensis (Selln.), 1925a.

36(1), 38(1), 80(16).

Plateremaeidae

Pedrocortesella gymnonotus Hammer, 1966.

32(1), 43(1), 62(1).

Eremobelbidae

Eremulus curviseta Hammer, 1971.

37(1), 38(3), 40(1), 52(1), 56(2).

Eremulus truncatus Hammer, 1971.

52(1).

Microzetidae

Microzetes auxiliaris Grandjean, 1936.

26(1), 37(16).

Carabodidae

Carabodes luteo-auratus Hammer, 1972.

81(1).

Austrocarabodes alveolatus n.sp.; fig. 9.

Colour yellowish. Length about 0.40 mm.

Usually the members of the genus *Austrocarabodes* are dark and dirty. The present species is very delicate, yellowish with light alveoli on a greyish ground, the alveoli being surrounded by a grey-bluish ring (the only specimen found may be a young individual). The rostrum protrudes as a hyaline lip between the tips of the lamellae. On this lip rest the lamellar hairs. The rostral hairs are situated behind the lip on short apophyses between which there is a forwards-directed tip. The hairs just reach beyond the lip. All the hairs on the propodosoma and the hysterosoma are slightly rough, hyaline, and long with a broad midrib, fig. 9a, which stands out in profile. The interlamellar hairs are longer than the lamellar hairs. The pseudostigmatic organs are hyaline with dark scales on the fang-shaped head. The lamellae are broad, hyaline and decorated with pits, especially in their anterior part. The sculpture between the lamellae consists of irregular pits as far posteriorly as a faint transverse line in front of the interlamellar hairs. Behind this line there is an irregular reticulation. The 14 pairs of notogastral hairs are of different lengths, the marginal ones being a little shorter.

The ventral side, fig. 9b. Apodema II, the sejugal apodema, and Apodema III are all narrow. The sternum is very faintly developed. In front of the genital field there is a curved chitinous bridge laterally reaching Acetabulum IV. The epimeric hairs are hardly discernible and not all of them could be seen. There are four pairs of genital hairs, but only their pores could be seen; one pair of very small aggenital hairs, two pairs of moderately long and strong anal hairs, and three pairs of adanal hairs, also strong and apparently slightly rough. Iad was not observed. The sculpture of the epimeres consists of more or less indistinct confluent pits or small alveoli. On the ventral plate there are distinct alveoli like those of the dorsum.

44(1).

Austrocarabodes falcatus n.sp.; fig. 10.

Colour light brown to brown. Length about 0.53 mm.

The rostral hairs, which reach for half their length beyond the tip of the rostrum, are foliate with a broad middle-rib and end in a thin tip. The lamellar hairs, situated on the outer rounded anterior corner of the lamellae, reach the tip of the rostrum. They are like the rostral hairs, but shorter. The interlamellar hairs are directed forwards and outwards. They are apparently a little stronger than the two former types of hair. The lamellae are yellowish with faint pits. Indistinct pits can also be seen behind the interlamellar hairs. The pseudostigmatic organs are short, the tip only slightly bent, rounded, and set with dark scales, fig. 10a.

The anterior border of the hysterosoma is slightly arched. The shoulders do not project, but are rather slightly concave. The notogastral hairs are sickle-shaped, in profile being long, semilunar, the thin tip bent upwards, fig. 10b; in a dorsal view they are foliate, fig. 10c. The anterior hairs appear shorter, which may be due to a fore-

shortening of the figure. The hairs do not overlap. The sculpture consists of light, irregular rounded spots surrounded by a greyish reticulation.

The ventral side, fig. 10d (shown on a larger scale than the dorsal side). The sternum is well developed widening into an angular plate between Apodemata II, forming a broad triangular plate between Epimeres III, and a smaller one in front of the genital field. The epimeric hair formula is 3-1-3-4, some of the medial hairs being absent, the remainder long, strong, and stiff. In front of the genital field there is a curved transverse ridge, which reaches Acetabulum IV, from where a strong tooth projects backwards. This can be seen under the integument. There are four pairs of long, thin genital hairs. Also the aggenital hairs are long and thin. The anal hairs are short, stiff spines. The adanal hairs are foliate like those of the dorsum. Ad3 is preanal, ad2 lateroanal, and ad1 postanal. The fissure iad was not observed. The ventral plate is faintly pitted to reticulate like the dorsal side.

Genu I has an inner very long spine, and a broad foliate hair on its outer side, fig. 10e. Genu II has a similar, but shorter and thinner spine. Monodactylous. 32(1).

Gibbicepheus novus n.sp.; fig. 11.

Colour clear brown. Length varying from 0.56 to 0.75 mm.

The lamellae are shaped as those of *G. frondosus* (AOKI), 1959, and also the hairs of the propodosoma are similar to those of *G. frondosus*, i.e. foliate ending in a tip and furnished with a middle-rib. However, the rostral hairs are a little longer than those of *G. frondosus* and are directed forwards (in *G. frondosus* they are appressed). One specimen had shorter and appressed rostral hairs. Between the lamellae and behind the transverse ridge illustrated by AOKI an irregular square can be seen at a deeper level. On either side of it a longish light field stretches forwards as far as the interlamellar hairs. The pseudostigmatic organs are long, slender and flat, widening slightly towards the end, which is bent upwards and backwards. The organ is set with short dark spines for most of its length.

The shoulders project beyond the anterior border of the hysterosoma. They are concave and strengthened by strong curved ridges. The sides of the hysterosoma are rough being covered by thick secretion, which forms a tongued brim on the posterior border. The notogastral hairs are broad, foliate and with a strong middle-rib ending in a thin tip. Apart from the anterior pair the hairs are so long that they overlap. Their position differs from that of *G. frondosus*, i.e. c2 is located further posteriorly than c1. The distances $c1-c1 = c1-c2 = c2-da$. C1-c1 is half as long as da-da. In *G. frondosus* c2 is situated anteriorly to c1. C1-c1 is twice as long as c1-c2. C1-c1 is not much shorter than da-da.

The sculpture of the dorsum consists of large alveoles of different shapes and sizes. The marginal zone is rough with chitinous tubercles and irregular, radiating wrinkles.

The ventral side, fig. 11a. Between Apodemata II there is a broad brown plate

bordered posteriorly by a curved ridge, which is the anterior border of another dilatation of the sternum. This plate, located between the sejugal apodemata, is a lighter colour than the plate between Apodemata II. Posteriorly it reaches a brown band in front of the genital field. Apodemata II, the sejugal apodemata, and Apodemata III are almost equally well developed. They are dark, almost black. Some of the epimeric hairs are long and strong, others could not be seen or are absent. The epimeres are covered by a secretion forming loose folds. There are four pairs of rather long genital hairs. The genital field is surrounded by ridges between which there is a slit(?). This system of ridges or lines continues in a broad curve almost to the anal field. The anal plates, which are faintly pitted to reticulate, have two pairs of short, stiff hairs. The inner margin of the anal plates is dentate. The aggenital hairs are long and thin. The adanal hairs are foliate like those of the dorsum. Ad3 is preanal, ad2 lateroanal, and ad1 postanal.

Genus I–II with a long foliate outer hair and a long inner feathered spine. Monodactylous.

28(2), 30(3), 36(2), 37(1).

Cepheidae

Compactozetes hastatus n.sp.; fig. 12.

Colour mahogany red. Length about 0.68 mm.

The rostral hairs can be seen only in a ventral view, fig. 12a. They are thin and smooth, bent medially, and situated on the sides of the narrow, conical rostrum. The anterior borders of the lamellae form a slightly undulating line, the lamellae being rounded medially and laterally ending in a small projecting tip. Between the lamellae there is a faint incurvation where the fused parts of the lamellae bend ventrally and fuse with the tip of the rostrum. The middles of the lamellae are separated by a narrow space widening off the pseudostigmata. The medial border of the lamellae continues anteriorly to the projecting lateral tip. The lamellar hairs, which are rather long, smooth, and curved, are situated at some distance from the lateral tip. Interlamellar hairs were not observed. The pseudostigmatic organs are long, spear-shaped (hence the specific name). Pedotecta I has a slightly undulating dorsal border and a white distal tip.

The anterior border of the hysterosoma is concave with the lamellae pressing into the border. The shoulders are triangular, projecting as far as the pseudostigmata, and ending in a small tip. The surface of the shoulders is irregularly reticulate. The lateral border of the hysterosoma, through which Femora III–IV can be seen, is more or less membranous and reticulate above Femur III. On the posterior border of the hysterosoma there are 6 thin, smooth hairs, and in front of these there are 6 similar though a little longer, dorsal hairs. Furthermore 6 hair pores can be seen with some difficulty on the dorsum.

Ventral side, fig. 12a. Only the anterior part has been shown as due to the dark colour details are extremely difficult to interpret; but it is apparently very similar to

that of *C. niger* HAMMER, 1966, fig. 104a. There are 6 pairs of genital hairs and two pairs of anal hairs. The lamellae are fused with the tip of the rostrum and also with the lateral border of the latter by two broad beams. Between the lamellae and the dorsal surface of the rostrum there is an open space, which opens ventrally by a hole on either side of the tip of the rostrum and by large lateral incurvations.

This species can be distinguished from the three previously described species, viz. *C. rotoruensis* HAMMER, 1966, and *C. niger* HAMMER, 1966, both from New Zealand, and *C. serratus* BALOGH, 1970, from New Guinea, by its long spear-shaped pseudostigmatic organs.

38(3).

Tectocephidae

Tectocephus minor Berl., 1903.

56(2), 66(14), 68(1), 71(1).

Tectocephus velatus (Michael), 1884.

A few individuals in a number of samples both from Tongatapu and from Upolu, most numerous in 66(36).

Oppiidae

Quadroppia circumita (Hammer), 1961.

62(1).

Oppiella nova (Oudms.), 1902.

26(7), 37(11), 52(4), 62(4), 63(13), 64(1), 68(2).

Oppia arcualis (Berl.), 1913.

26(1), 51(1).

Oppia exigua (Hammer), 1971, (= *Oppia exiguus*); fig. 13.

The Tonga specimens differ a little from the type from Viti Levu, the Fiji Islands. Thus the chitinous ridge in front of the anterior border of the hysterosoma is more like a thickening of the surroundings of the posterior light spots. The pseudostigmatic organs are longish clubs when stretched out (not round as illustrated in HAMMER 1971, fig. 24). The notogastral hairs are a little longer. There are only nine pairs of notogastral hairs as p3 are missing (the p-hairs are interpreted erroneously in fig. 24, 1971). Im, which could not be seen on the specimens from the Fiji Islands, are very long and located in front of te. The ventral side agrees with that of the type.

37(1), 53(4).

Amerioppia Woolleyi Hammer, 1968.

60(1).

Amerioppia octocoma n.sp.; fig. 14.

Colour light brown. Length about 0.33 mm.

The rostral hairs are long and barbed, the lamellar hairs as long as their mutual distance, thin and smooth. Interlamellar hairs absent. The pseudostigma has a broad collar surrounding its opening with two faint lobes on the posterior border. The pseudostigmatic organs are very long and slender, a little thicker only at the end, which is set with minute bristles. The organs are directed outwards.

The notogastral hairs are of very different lengths, eight of them, viz. ti, te, ms, and r2, being very long and slightly barbed, some on the posterior border, viz. p2, p3, are hardly discernible, while some are missing, r3. In front of p1 two small tubercles can be seen, perhaps the site of r1. The eight long hairs, which are elegantly curved and radiating, are very characteristic (hence the specific name).

The ventral side, fig. 14a. The sternum is broad in its anterior part, narrow between the sejugal apodemata and the genital field. There are four pairs of genital, one pair of aggenital, two pairs of anal, and three pairs of adanal hairs. Ad1 are postanal. Iad can be seen close to the lateral side of the anal field.
68(8).

Amerioppia decemsetosa n.sp.; fig. 15.

Colour light brown. Length about 0.37 mm.

The propodosoma is characteristic and needs no comment apart from the pseudostigmatic organs. They are a little longer than their mutual distance, the club slender, thickest at the middle and tapering towards the pointed tip. The head is set with minute bristles. The stalk is undulating and directed outwards.

The length of the notogastral hairs and the distances between them are of specific importance within *Amerioppia*. The 10 pairs of notogastral hairs in the present species are of very different lengths. Ti, te, ms, r3, and r2 are very long, curved, and swung outwards and backwards. R1 are approximately half as long as the latter, and p1, p2, and p3 are a little shorter than r1. Ta is minute. All the hairs except ta are barbed. R1 is thinner than the others. The distance ti-ti is the same as ms-ms, te-te almost the same as r3-r3. R2-r2 is longer than ms-ms and shorter than r3-r3. A small pore can be seen behind ti; it is present in many *Amerioppia* species.

The ventral side, fig. 15a. The sternum is present for its whole length. Apodemata II and the sejugal apodemata form two transverse bands. The epimeric hair formula is 3:1:3:4. The paraxial hairs are small, the others long and barbed; 1b is especially long. The genital field has four pairs of hairs. The aggenital, the anal, and the adanal hairs are long and barbed. The aggenital hairs are situated closer to the anal field than to the genital field. Iad is located near the lateral anal border.
38(3), 40(1), 44(1), 52(11).

Ramusella chulumaniensis (Hammer) var. *curtipilus* Hammer, 1971.

30(3), 37(2), 38(1), 52(1), 68(2).

Machuella lineata n.sp.; fig. 16.

Colour dirty, light brown. Length about 0.195 mm.

The present species, of which only one specimen was found, differs in several ways from the typical *Machuella*, i.e. there are no longitudinal lines issuing from the anterior border of the hysterosoma, usually reaching as far as te. The notogastral hairs, which are very short and directed medially, are arranged in two longitudinal lines (hence the specific name). There is almost the same distance between the two hairs of the different pairs. P1–p3 are situated in a curved line, rather close together. The membranes suspended dorsally above Coxa III–IV do not proceed beyond the transition between the propodosoma and the hysterosoma.

I am unable to discern the long epimeric hairs on the ventral side due to a thick layer of secretion. The number of genital, aggenital, anal, and adanal hairs agrees with the typical species.

62(1).

Suctobelbidae

Suctobelba variosetosa Hammer, 1961.

26(1), 62(1), 68(3), 69(3), 78(1).

Suctobelba semiplumosa Balogh & Mahunka, 1967, var. *tahitiensis* Hammer, 1972.

37(3), 52(4), 62(1), 69(6).

Suctobelba insulana Hammer, 1972.

69(1).

Eremellidae

Eremella induta Berlese, 1913.

43(2).

Dampfiellidae

Dampfiella dubia Hammer, 1971.

37(3), 38(4).

Dampfiella euaensis n.sp.; fig. 17.

Colour brown. Length about 0.68 mm.

The rostrum is surrounded by a yellowish hyaline brim above which the rostral and lamellar hairs are situated. These hairs are curved and finely unilaterally barbed. The interlamellar hairs are apparently smooth, and about half as long as their mutual distance. Near their base there is a pore. The exopseudostigmatic hairs were not observed, only the pores. The pseudostigmatic organ is a long slender club, broadest distally and with a few rough setae at the tip, the head set with minute hairs. There are

three groups of light spots between the pseudostigmata, the lateral ones crowded, the middle one with space between the spots.

The notogaster is twice as long as broad, broadest across ms and narrowest in front of the withdrawing shoulders. There are 10 pairs of straight, almost smooth notogastral setae. They are approximately equally long, ta being a little shorter, ms perhaps a little longer. 6 pairs are dorsal, 4 pairs marginal-caudal. The distance p1-p1 is approximately the same as p1-p2. P3-r3 is longer, but the two sides in fig. 17 are not fully symmetric. Te is situated only a short distance in front of im and gl. The fissures, im, ih, ips, and ip, are distinct.

The ventral side, fig. 17a. The epimeres show many light spots arranged in symmetric groups. The surrounding integument is light brown to dark brown. In front of the narrow Apodemata II there is a broad, dark brown, transverse band in which the "cuvettes" can be seen. The sejugal apodemata are short and surrounded by dark chitin, which medially forms an irregular narrow transverse band. Apodemata III are broad and much longer than the sejugal apodemata. Between them there is also a narrow transverse connection. The sternal ridge is narrow and not present for its whole length. In front of the genital field there is a diffuse dark brown "shadow" without definite borders. The epimeric hairs are not discernible. There are three pairs of genital hairs, viz. one pair near the anterior border and two close together at the posterior end. The aggenital hairs are small, the adanal hairs of different lengths, ad3 being short and thin, ad2 short and thick, and ad1 longer and thick.

This species has several characteristics in common with *D. similis* HAMMER, 1971, and *D. dubia* HAMMER, 1971, both from the Fiji Islands, viz. long sloping shoulders, 4 notogastral marginal-caudal hairs, a broad transverse band in front of Apodemata II, none in front of the genital field, and three pairs of genital hairs. 51(2).

Otocephelidae

Dolicheremaeus euaensis n.sp.; fig. 18.

Colour dirty to light brown. Length about 0.57 mm.

The finely barbed rostral and the lamellar hairs are directed medially in a large curve. The interlamellar hairs, which are slightly barbed, reach halfway to the tip of the rostrum. The lamellae are almost equally broad throughout. Between the ends of the lamellae there is a hole in the integument with a tip projecting from the border. The integument between the lamellae is finely punctate in oblique lines. The pseudostigmatic organs are spoon-shaped, in profile slightly thicker towards the tip, fig. 18a. The medial prodorsal condyles are absent, the lateral ones low and triangular.

The anterior border of the notogaster is almost straight, and the lateral notogastral condyles are scarcely defined. The integument of the dorsum is densely punctate. The notogastral hairs are finely barbed. They vary a little in length, p1-p3 being slightly shorter. Ti, ms, and r2 are situated on a straight line. The fissure ia is located laterally to ta, im behind te and laterally to ti, ih between r3 and ms, and ip between p1 and p2.

The ventral side, fig. 18b. The sternum is developed for its whole length and moderately broad, widening into a broad curve in front of the genital field. Apodemata II and the sejugal apodemata are narrow and long enough to reach the sternum. Apodemata III are short. The epimeric hair formula is 3:1:3:3. The paraxial hairs are shorter than the lateral ones. All are slightly barbed. The epimeres are densely punctate, and in Epimer I a distinct reticulation can be seen anteriorly. The genital field is brown and smooth. There are four pairs of short genital hairs. The aggenital hairs are shorter than the adanal hairs. The latter are very thin towards the tip. The distance ad3–ad3 is equal to ad2–ad2. Ad1 are postanal. Iad is situated near the anterior corner of the anal field, parallel to the lateral border. The integument of the ventral plate is densely punctate.

The ultimate hairs of the tarsi have the formula L–L–L–L.

The formula of the solenidia of genu, tibia and tarsus is I(1–2–2), II(1–1–2), III(1–1–0), IV(0–1–0).

Discussion: The present species is very close to *D. oginoi* (AOKI), 1965, from Thailand, but can be distinguished from the latter by its spoon-shaped pseudostigmatic organs, the much shorter prodorsal and notogastral lateral condyles, the hairs ti, ms, and r2 on a line, its smooth genital field and the distances ad3–ad3 being equal to ad2–ad2. 52(1).

Neotrichocephus n. subgen.

The new subgenus has almost all the characteristics of its genus *Dolicheremaeus* Jacot, viz. lamellae well developed, reaching beyond lamellar hairs, two pairs of prodorsal and two pairs of notogastral condyles, 10 pairs of notogastral hairs, 5 pairs of notogastral fissures, genital plate brown, 4 pairs of genital hairs, 2 pairs of anal hairs, 3 pairs of adanal hairs, and adanal fissure close to anal aperture.

It differs, however, by the presence of epimeral and aggenital neotrichy.

Neotrichocephus tongaensis n.sp.; fig. 19.

Colour light brown. Legs and genital field brown, lateral membranes yellowish-grey. Length about 0.87 mm.

At the tip of the rostrum there is a low incurvation, best seen in a ventral view. The lamellae, which reach the tip of the rostrum, are equally broad throughout. They are smooth. The rostral, the lamellar, and the interlamellar hairs are flagelliform and smooth, the first being shorter than the others. The interlamellar hairs are situated in the anterior part of a finely striated area between the pseudostigmata. The exopseudostigmatic hairs are moderately long. The pseudostigmata, which open outwards, are half hidden below the posterior part of the lamellae. The pseudostigmatic organs are long bacilliform. On the dorsal side of Pedotectum II there is a chitinous ridge running obliquely backwards. The four prodorsal condyles are equally broad, the lateral ones a little longer than the medial ones. The integument of the propodosoma is foveolate

laterally to the lamellae and laterally to the pseudostigmata. It is finely striated between the lamellae.

The hysterosoma is much longer than broad. It is broadest at a level between ti-ti and ms-ms. The borders are smooth. The medial notogastral condyles are semi-circular, separated by a distance shorter than the width of the condyles. The lateral condyles are broad, triangular and much longer than the medial ones. The 10 pairs of notogastral hairs are all very long, flagelliform, smooth, often with the tip bent. Four of them are marginal-caudal. Ta is a little shorter than the others. There are five pairs of fissures. Ia is located in front of ta. Im can be seen behind gl. Ih and ips are situated in front of r3 and laterally to ms, and ip between p2 and p3. The integument is decorated with very fine, irregular, branched lines, running more or less longitudinally, slightly radiating, forming large meshes. At a deeper level there is a fine punctation.

The ventral side, fig. 19a. Apodemata II meet in the median line. The sejugal apodemata are imbedded in a broad transversal band. Apodemata III-IV are absent. Epimeres III and IV are fused. The sternum is faintly developed. Within its border there is a narrow longitudinal band, which posteriorly reaches the sejugal band. The integument of the epimeres has a few large pits besides a fine striation forming large meshes. Neotrichy is present in Epimeres I-III, the hair formula being 9:5:6:4. The epimeric hairs are not arranged fully symmetrically. Most of the hairs are short and apparently smooth, the lateral ones are flagelliform. The sides of the epimeral region and of the gnathosoma are surrounded by yellowish-grey membranes, more or less hyaline and striated.

In front of the genital field there is a curved line running to Acetabulum IV. There are four pairs of smooth genital hairs, moderately long and all directed backwards. The genital plates are brown. Aggenital neotrichy is present, there being five pairs of irregularly arranged aggenital hairs. Besides the five pairs of hair pores, several smaller, but very distinct pores can be seen. The anal field is square. There are two pairs of long flagelliform anal hairs, and three pairs of similar adanal hairs. Ad3 and ad2 are located laterally to the anal field, ad1 is postanal. The distance ad3-ad3 is longer than ad2-ad2. Iad is located near the lateral border of the anal field. The integument of the ventral plate has the same finely striated pattern as found on the dorsum.

Legs. Type of ultimate setae: L-S-S-S. Number of solenidia on genu, tibia, and tarsus I(1-2-2), II(1-1-2), III(0-1-0), IV(0-1-0).

38(3), 52(1).

(?)*Pseudotocepheus radiatus* n.sp.; fig. 20.

Colour light brown to brown. Length about 0.725 mm.

The rostrum is conical and rounded. The rostral and the lamellar hairs are slightly barbed, the latter a little longer than the former. The lamellae are straight for most of their length with a distinct lateral border and an indistinct medial border. There is no cuspis, no prolongation of the lamellae beyond the lamellar hairs, and no

translamella. The interlamellar hairs are as long as the lamellar hairs and also finely barbed. The space between the lamellae is foveolate in its anterior part, very irregularly foveolate-reticulate in its posterior half. The pseudostigmatic organs are longish clubs, set with minute hairs. Exopseudostigmatic hairs were not observed. The prodorsal condyles are irregular in shape, and the median ones are broader than the lateral ones. The median condyles are separated by a distance a little longer than the width of the condyles.

The anterior border of the notogaster is straight, the posterior angular, and the lateral ones a little rough, especially anteriorly. The medial notogastral condyles are irregular, more or less confluent, the lateral condyles are triangular. The notogastral hairs are stiff, some of them slightly curved; they are thinner at the base and barbed for their distal two-thirds, fig. 20a. Four pairs are marginal-caudal. These are more stiff and radiating (hence the specific name). The hairs are inserted in wide holes (see sketch, fig. 20a). *te* and *ti* are on a longitudinal line, *ti* being situated far posteriorly. The fissure *ia* is located laterally, behind *ta*, *im* near the lateral border, behind *te*. The dorsal surface is irregularly foveolate.

The ventral side, fig. 20b. The sternum is well developed for its whole length. Apodemata II and the sejugal apodemata form two transverse bands. Apodemata III half separate Epimeres III and IV. The epimeric hair formula is 3-1-4-3. The paraxial hairs are shorter than the lateral ones. All are slightly barbed. Pedotecta are well developed, III is pointed, IV lobe-shaped. The genital field has three pairs of rather long genital hairs. The aggenital hairs are missing in the only specimen found, the pores distinct. The anal and the adanal hairs are strong and barbed. *Ad3* is preanal, *ad2* lateroanal, *ad1* postanal. *Iad* is located in front of *ad2*, transversally. As *iad* is not preanal there may be some doubt whether the present species belongs to *Pseudotocepheus*.

The ventral plate is foveolate.

Femora I-II with a ventral keel and a sharp distal tooth.

This species seems to be closely related to *Pseudotocepheus foveolatus* HAMMER, 1966. However, the latter has very long and thin notogastral hairs.
44(1).

Adhaesozetidae (new family)

Adhaesozetidae belong to the Pycnoticae, and within this large group they are close to Oppioidea. The family has the following characteristics: all tarsi with an adhesive disc, tridactylous. Propodosoma and hysterosoma separated. Lamellae complicated with cusps. 13 pairs of notogastral hairs, some placed within framed figures. The dorsal shield bent slightly ventrally. The epimeric region with ridges and teeth. Genital and anal fields separated. 6 pairs of genital hairs, one pair of aggenital, two pairs of anal, and three pairs of adanal hairs. Chelicerae strong.

Adhaesozetes Barbarae Hammer, 1966.

45(1).

Hydrozetidae

Hydrozetes lemnae (de Coggi), 1899.
77(1).

Cymbaeremaeidae

Scapheremaeus sp. (not described as only an incomplete skin was found).
52(1).

Licneremaeidae

Licneremaeus polygonalis Hammer, 1971.
28(1), 30(3), 37(23), 40(1), 52(2).

Eupelopidae

Eupelops tahitiensis Hammer, 1972.
37(1), 50(9).

Nesopelops n.gen.

Nesopelops differs from *Eupelops* by its broad truncate notogaster, by the position of the notogastral hairs situated far more laterally than in *Eupelops*, and by being monodactylous.

Nesopelops caudatus n.sp.; fig. 21.

Colour brown. Length about 0.49 mm.

The rostrum is pointed. The tip of the cusps, which embrace the rostrum, reach two-thirds the distance from the translamella to the rostral tip. The lamellar hairs are rather short and apparently smooth. The rostral hairs, situated more laterally and at a deeper level than the lamellar hairs, are longer than the latter and slightly rough. The interlamellar hairs (the middle part of the right one is not shown in fig. 21) seem to be faintly chitinized at the middle near the tip, fig. 21a. The pseudostigmatic organs are slender, slightly thickened at the end, which is densely hairy. They are about half as long as their mutual distance.

The projection on the anterior border of the hysterosoma is slightly concave. The hysterosoma is very broad, its posterior end truncate with a small tubercle (tail) in the middle. Corresponding to this tubercle a similar one can be seen on a ridge parallel to the posterior border, but at a deeper level. There are 10 pairs of notogastral hairs, viz. eight moderately long, clavate, with bristles on their posterior border, and two very short, rod-shaped ones situated ventrally on the posterior border. If we compare the position of the notogastral hairs with LIONS, 1970, fig. 3, it is evident that lm, lp, and h1, which in *Eupelops* are situated in a row in the middle of the dorsum, are displaced near to the lateral border leaving the middle of the dorsum bare. C2, la, h3, and h2 are situated as in *Eupelops*. The integument is covered with small dark tubercles, which at a deeper level appear light.

The ventral side, fig. 21b. There are 6 pairs of genital hairs, no aggenital hairs, two pairs of anal hairs, and two pairs of adanal hairs. Ad1 are situated a long distance behind the anal field off the posterior tubercle.

Figs. 21c, d show Legs I–II. Tarsi II and III have an almost smooth, dorsal spine. Tibiae I–II a similar spine, Genu II a shorter one. Monodactylous. On the inner edge of the claw there is a secondary tooth directed towards the tip of the claw.
30(3), 38(2), 40(4), 52(12).

Nesopelops samoensis n.sp.; fig. 22.

Colour brown. Length about 0.48 mm.

The rostral hairs are situated at the base of the free tip of Tutorium. They are as long as the lamellar hairs and like these rather thick and rough. The lamellar hairs reach the tip of the rostrum. The interlamellar hairs, which are broadest distally, are almost smooth with scales only distally and along the borders. The pseudostigmatic organs, which are densely hairy broad clubs, reach as far as the posterior border of the broad translamella.

The hysterosoma is broader than long, the posterior end truncate. The broad projection on the anterior border of the hysterosoma has two low rounded lobes. There are eight pairs of strong notogastral hairs and two tiny ones, which can be seen only in a ventral view, fig. 22b. The strong hairs are more or less erect, bent, hairy and with a middle-rib, fig. 22a. As in the preceding species, lm, lp, and h1 are displaced from the middle of the dorsum to the sides of the latter. P1 are a little shorter than the other dorsal hairs.

The ventral side, fig. 22b. A true sternum is not developed, only irregular folds. Apodemata II and the sejugal apodemata are parallel, straight, and narrow. Apodemata III are short and indistinct. Half covering Apodemata III there is a thin brown plate bordered laterally by a light furrow, which seems to continue very faintly both forwards and backwards. Only six pairs of epimeric hairs were observed. There are six pairs of genital hairs, viz. four in the anterior half of the plates and two in the posterior half. The genital field is anteriorly surrounded by a brown brim, which continues laterally almost to Acetabulum IV and posteriorly fusing with the dark brim round the anal field. Aggenital hairs are absent. There are two pairs of anal hairs and two pairs of adanal hairs, ad3 being absent. The fissure iad is located near the latero-anterior corner of the anal field. Ad2 is situated behind iad, and ad1 postanal. All the hairs of the ventral side are short and thin.

Tarsus II has a strong branched spine, Tibia II a shorter one, Genu II a thin one. Tarsus I has no spine, Tibia I a thin feathered spine. On the inner margin of the claw there is a secondary tooth as in the preceding species.

64(1), 66(1).

Nesopelops tongatapuensis n.sp.; fig. 23.

Colour clear brown. Length about 0.39 mm.

The rostral hairs, situated between the tip of the rostrum and the Tutorium, are twice as long as the lamellar hairs. They are rather thick and rough. The lamellar hairs are much thinner and apparently smooth. The pseudostigmatic organs are short, thick clubs, which do not reach the translamella.

The hysterosoma is as broad as it is long and not so distinctly truncate as that of the two preceding species. The anterior projection is divided into two low lobes. The anterior part of the pteromorphae is a much lighter colour than the posterior part. The notogastral hairs, of which only seven pairs were observed, are short thin spines.

The ventral side, fig. 23a, much resembles that of the two preceding species. In front of Apodema III there is a semilunar plate ending medially in a thin tip.

38(1).

Remarks. Under *Nesopelops* must be included *Pelops punctatus* (Ramsay) Hammer and *Pelops monodactylus* Hammer, both New Zealand, Hammer 1966. In describing these I wrote that some of their characteristics were probably important enough to establish a new genus. Also *Eupelops crassus* Hammer and *Eupelops polynesius* Hammer, both Tahiti, Hammer 1972, belong to *Nesopelops*.

BALOGH describes and illustrates three new *Eupelops* species from New Guinea, 1970, which in the broad truncate notogaster and the lateral displacement of some of the notogastral hairs recall *Nesopelops*. Unfortunately BALOGH does not mention the number of claws for which reason their position in the system is uncertain. He is, however, aware of the differences from all *Eupelops* species described and writes "they presumably constitute a distinct species group".

Species belonging to this genus have so far been found only in the Pacific area, hence the generic name.

Oribatellidae

Oribatella schoutedeni Balogh, 1959.

63(2).

Lamellobates palustris Hammer, 1958.

30(3), 45(2).

Tegoribatidae

Eremaeozetes octomaculatus n.sp.; fig. 24.

Colour brown. Length about 0.455 mm.

Together the lamellae and the cusps are a little longer than broad. The sides of the lamellae are parallel. Medially the lamellae proceed forwards forming a tip attached to the medial border of the cusps. In this way the prolonged lamellae cover a part of the cusps. The latter are rounded anteriorly and have parallel sides. The lamellae and the cusps are covered with a reticulation, the meshes of which are of different sizes, i.e. longish along the medial border, short and separated by dark brown ribs at the middle of the lamellae. Neither rostral hairs nor lamellar hairs were observed.

The interlamellar hair pores can be seen medially to the pseudostigmata. In the space between the lamellae there is a figure, which is rounded posteriorly and reaches forwards to the lamellar arch. The pseudostigmata are situated behind the lamellae, the posterior borders of which run transversally. The pseudostigmatic organs are strongly dilating clubs, their whole surface set with black scales.

The hysterosoma is very peculiar having eight smooth, brown spots arranged symmetrically on the dorsum. The anterior one, lenticulus, is slightly oval, then follow two large pear-shaped spots, which are narrowest laterally. At the middle of the dorsum there is an almost square spot, flanked by two longish, slightly curved spots. At the posterior end there are two round large spots. These eight spots are very distinct being separated by a distinct reticulation of thick brown ribs surrounding small light brown meshes of different sizes and arranged irregularly. The anterior border of the hysterosoma is slightly arched, the sides almost parallel, and the posterior end undulating. The pteromorphae are mobile and short, but very broad and pointed distally, bending ventrally, fig. 24b. Along the borders of the hysterosoma there is a brim with long, greyish meshes. This brim also surrounds the six broad tubercles on the posterior border of the hysterosoma. Off the square central spot the brim turns medially towards the longish curved spots, where it disappears. On the posterior border of the hysterosoma 14 hairs can be seen. They are hyaline, almost globular, like mushrooms with a thick stalk set in a deep cup on the projecting tubercles, fig. 24a. Besides these hairs there are two hairs in the large middle spot and apparently one on each side of the dorsum at the anterior end of the longish lateral spots. The latter hairs cannot be seen, probably due to their hyaline structure. A very distinct reticulation with polygonal meshes of different sizes covers the whole dorsal surface, also the spots.

The ventral side, fig. 24b. Due to a similar dark brown reticulation as on the dorsum, details on the ventral side are difficult to see. There are 6 pairs of genital hairs, all very short and hardly discernible. Aggenital hairs were not observed. Ad3 and ad2 are globular and hyaline, situated behind each other and set in a polygonal mesh, which is larger than the surrounding meshes. Ad1 appears longish, and is postanal. The anal hairs are globular, hyaline, smaller than ad2, ad3.

Pedotecta I–II are thick, well developed. Leg III is protected by the pteromorphae, being bent ventrally, the distal tip reaching Coxa III. Pedotectum IV is spine-shaped. Monodactylous.

59(9), 60(1), 73(1).

Ceratozetidae

Allozetes translamellatus n.sp.; fig. 25.

Colour light brown with a slightly darker belt across the hysterosoma. Length about 0.27 mm.

A. translamellatus differs from the two previously described species, viz. *A. pusillus* (BERL.), 1913 and *A. africanus* BALOGH, 1958, by having a well developed,

almost straight and narrow translamella. The lamellae are broad and complicated as the cuspis is separated by a narrow furrow from a broad triangular tooth, which is attached to the lateral side of the median lamellar thickening. From the inner side of the cuspis a membrane runs medially across the proximal half of the tooth, being attached to the median lamellar thickening. The space between the lamellae is a little narrower distally between the teeth. At its base the lamellar hair is almost as thick as the cuspis. It is barbed, tapering towards the tip and together with the opposite hair forms an arch in front of the rostrum. The rostral hairs are much thinner than the lamellar hairs and also barbed. Interlamellar hairs are absent. In front of the translamella, the anterior border of which continues in the anterior border of the triangular teeth, there is a light hole with a broad triangular tooth projecting from its posterior border. The pseudostigmata are completely hidden under the anterior margin of the hysterosoma. The pseudostigmatic organs are rod-shaped, almost equally thick throughout and distally set with short dark barbs. They make a bend forwards just outside the cup. The tutorium reaches beyond the base of the rostral hair. It is longitudinally striated.

The anterior border of the hysterosoma is straight above the lamellae, but absent between the latter, laterally withdrawing in a long curve. There are 10 pairs of rather strong notogastral hairs, most of which are directed forwards. In the middle of the dorsum there is a pore. The sculpture consists of an indistinct pattern of light pits or reticulation.

The ventral side, fig. 25a. The sternal ridge is short and narrow. The apodemata are narrow. Apodemata II and the sejugal apodemata are parallel. The latter and Apodemata III meet on the anterior border of a broad chitinous band in front of the genital field. Apodemata IV are absent. The epimeric hairs are indiscernible, their pores not always arranged symmetrically. The genital field is twice as broad anteriorly as posteriorly. There are six pairs of hairs, situated almost in a circle. There are one pair of aggenital hairs, two pairs of anal hairs, and three pairs of adanal hairs, all of them so small that they are hardly discernible. Ad1 and ad2 are postanal, situated with a mutual distance half as long as ad1–ad1. Iad is located in front of ad3. A very fine sculpture, like that of the dorsum, can be seen on the ventral plate.

Legs. Tibia II has an outer dorsal spine, Genus I–II a much smaller outer spine. Coxae III–IV have a forwards directed tooth. Monodactylous.
68(7), 69(61), 71(1).

Allozetes dispar n.sp.; fig. 26.

Colour light brown, darker across the middle of the hysterosoma. Length about 0.30 mm.

The lamellae are narrow compared with those of *A. translamellatus* and without the complicated structure of the latter, although there is a furrow between the cuspis and the median lamellar thickening. There is no translamella, but a very faint line. The lamellar hairs are thinner than in the preceding species, especially at the tip.

Interlamellar hairs are missing. The space between the lamellae is much broader than in *A. translamellatus*. The pseudostigmatic organ is more flat than in the preceding species, truncate at the tip and set with minute bristles. The right one in fig. 26 is seen from the edge. The pseudostigmata are only half hidden below the anterior border of the hysterosoma.

The anterior border of the hysterosoma is a broad low arch, broken at the middle. The 10 pairs of notogastral hairs are hardly discernible. There are four pairs of areae porosae. In none of the other so far described *Allozetes* species were areae porosae observed. The pore in the middle of the dorsum is missing. This pore is present in *A. africanus* and *A. translamellatus*, but neither mentioned nor illustrated by BERLESE in *A. pusillus*.

The ventral side, fig. 26a, is very similar to that of *A. translamellatus*, although the sternal ridge is much broader. The hairs are distinct, whereas they are not discernible in *A. translamellatus*. Legs like those of the preceding species. Monodactylous. 47(6), 50(37).

Anellozetes discifer n.sp.; fig. 27.

Colour light brown with two light spots on the pteromorphae separated by a darker field. Length about 0.30 mm.

This species can be distinguished from all other so far described species within *Anellozetes* by its very long and strong lamellar hairs combined with short, thin interlamellar hairs and its short pseudostigmatic organ with a large, round disk-shaped head. The notogastral hairs could not be seen, the hair pores are arranged as shown in fig. 27. The fissure ia is located obliquely on the rib bordering the posterior margin of the anterior spot of the pteromorpha.

62(3).

Humerobates fungorum(L.); fig. 28.

Only the propodosoma and a little part of the hysterosoma with Aa is shown.

51(1).

Mochlozetidae

Urobates n.gen.

Hysterosoma very broad, shield-shaped ending in a conic tubercle. 4 pairs of large areae porosae. 11 pairs of notogastral hairs. Pteromorphae long, not mobile. Lamellae with cuspis. Translamella present. Pseudostigmatic organs clavate. Sternum absent. Apodemata II very short. The sejugal apodemata and Apodemata III longer and narrower. 6 pairs of genital hairs, one pair of aggenital hairs, two pairs of anal hairs, and three pairs of adanal hairs. Tridactylous.

Urobates pygiseta n.sp.; fig. 29.

Colour light brown, but a darker belt across the hysterosoma is almost mahogany red. Length about 0.62 mm.

The propodosoma is about half as broad as the hysterosoma. The rostrum is broadly rounded with two small projecting teeth. The rostral hairs, which are situated laterally, are thin, barbed, and longer than their mutual distance. The proximal part of the lamella is narrow, then it widens and is broadest off the narrow, slightly undulating translamella. On the cuspis there is a lateral very pointed tip, medially to which is situated the lamellar hair. This hair is thicker than the rostral hair, barbed, and reaches a little further beyond the tip of the rostrum than the rostral hair. The interlamellar hair is situated on the dorso-sejugal line, which is hardly discernible at its middle. It is a very long, thin, slightly barbed ligament. The pseudostigma is half hidden below the anterior border of the hysterosoma. The pseudostigmatic organ is short, clavate, rounded distally. The stalk is as long as the head.

The anterior border of the hysterosoma between the interlamellar hairs is straight. The pteromorphae, which are immovable, are very broad and very long, reaching A2. A fine striation can be seen on their anterior part. There are four pairs of slightly elevated equally large areae porosae. The 11 pairs of notogastral hairs are hardly discernible, their pores distinct. They are arranged as shown in fig. 29. The posterior pair is situated near the tip of the conic "tail". The integument shows an indistinct dendrite pattern.

The ventral side, fig. 29a. No sternum. Apodemata II are very short, the sejugal apodemata and Apodemata III rather short and narrow, not reaching the border of the genital field. The epimeric hairs are moderately long. 1b is situated on the end of the circumpedal ridge. There are six pairs of long, smooth genital hairs, of which the three anterior pairs are directed forwards, the posterior ones medially. One pair of aggenital hairs, two pairs of anal hairs situated one at either end of the plates, and three pairs of adanal hairs. Ad3 are located laterally, a short distance in front of iad. The latter is a little removed from the anal field. Ad1 and ad2 are postanal and longer than ad3.

Pedotecta I and II are well developed. The legs are long and slender. Femur II is broad, with a ventral keel. Coxa III is angular. The hairs of the legs are very long, slightly barbed. There are three claws, the middle one of which is only slightly thicker than the lateral ones.

Urobates pygiseta is very similar to *Uracrobates magniporosus* BALOGH & MAHUNKA, 1967, except concerning the pteromorphae, which are movable in the latter for which reason the authors place it within Haplozetidae. *Urobates* is related to *Podoribates* (*Sphaerobates*) and very similar to this genus in almost every detail. It can, however, be distinguished from the latter by its very long pteromorphae and by the shape of the hysterosoma ending in a conic "tail".

30(1).

Oripodidae

Subphauloppia luminosa n.sp.; fig. 30.

Colour clear brown. Length about 0.32 mm.

The rostrum is very broad, rounded. The rostral hairs are situated laterally at some distance from the anterior border. They are rather thin and barbed. The lamellar hairs are thicker and shorter than the latter, about as long as their mutual distance. They are situated halfway between the rostral hairs and the anterior border of the hysterosoma. Lamellae absent. The interlamellar hairs are situated far behind the anterior border of the hysterosoma, which projects halfway between the lamellar hairs and the interlamellar hairs. The latter are as thick as the former and densely barbed. A thin line can be seen between the interlamellar hairs and the broad pseudostigmata. A faint line on either side runs from the interlamellar hair forwards and near this line there is an area porosa sublamellaris. The field between these lines is transversally wrinkled. The pseudostigmata are hidden under the border of the hysterosoma, but the pear-shaped club is completely free. An exopseudostigmatic hair pore is present.

The hysterosoma is longish, oval, though a little more pointed anteriorly, where the anterior border reaches halfway between the lamellar and the interlamellar hairs. The 10 pairs of notogastral hairs are rather short, thin, and finely barbed. Small luminous dots are scattered irregularly over the whole dorsal surface (hence the specific name). There are four pairs of areae porosae of approximately the same size.

Ventral side, fig. 30a. No sternum. Apodemata II, the sejugal apodemata, and Apodemata III are all very short and narrow. The epimeric hair pores are distinct, but as the hairs are hardly discernible, their length cannot be verified. There are only two pairs of very small genital hairs. The two pairs of anal hairs and the three pairs of adanal hairs are moderately long and barbed. Across the anal plates there is an oblique line. Iad is located near the anterior border. Like the dorsum the ventral side is decorated with small luminous dots. Tridactylous.

This species can be distinguished from *S. dentonyx* HAMMER, 1967, by its very narrow hysterosoma between the pseudostigmata, and its distinct luminous dots. 52(2).

Subphauloppia glaber n.sp.; fig. 31.

Colour light brown. Length about 0.365 mm.

As this species is very similar to the preceding one only the most important characteristics will be mentioned. The rostrum is slightly pointed. The rostral hairs are rather thin and barbed. The lamellar and the interlamellar hairs are almost alike, the latter slightly thicker. The pseudostigmata are not hidden under the anterior border of the hysterosoma, and the pseudostigmatic organs are shorter than in *S. luminosa*. The space between the lamellar and the interlamellar hairs is smooth, i.e. without transversal wrinkles (hence the specific name). On either side of the lamellar hairs there are small pits. Small luminous dots are present within the pits as well as on the whole dorsal and ventral surface.

The anterior border of the hysterosoma forms an arch, which is broader than in the preceding species. The hysterosoma is pear-shaped, the posterior half semicircular. The notogastral hairs are apparently slightly barbed. Of the posterior hairs only p1 can be seen in a dorsal view. P2, which is appressed, can be seen only in a ventral view, fig. 31a.

The ventral side, fig. 31a, is very similar to that of the preceding species. Most of the epimeric hairs, however, were invisible, and the number of genital hairs could not be determined due to the open plates. As in *S. luminosa* there is an oblique line across the anal plates.

51(1).

Phauloppia caudata n.sp.; fig. 32.

Colour white-yellowish. Length about 0.32 mm.

The rostrum is broad, rounded. Below the rostrum a structure like a hyaline tongue projects, perhaps a layer of secretion. The rostral hairs, which are situated laterally, are thin, finely barbed, and shorter than their mutual distance. The lamellar hairs are equally thick throughout, barbed intermittently, and about as long as their mutual distance. They are situated at the end of the narrow costulae. The latter bend medially off the interlamellar hairs; these are shorter than the lamellar hairs and barbed. The pseudostigmatic organs are globular, the stalk very short. On the latero-posterior border of the pseudostigma there is a pointed tip.

The hysterosoma is longish, oval, apart from a broad lobe on the posterior border looking like a tail (hence the specific name). The 14 pairs of notogastral hairs are moderately long and barbed. Those at the middle of the dorsum are directed medially, the others radiating. H1 and ps1 are situated at the base of the tail close behind each other. A3 is located laterally to h1, and very near the border of the hysterosoma.

As only a skin of this very characteristic mite was found, the ventral side has not been shown, being incomplete. The ventral plate is drawn out into a tongue fitting into the dorsal tail. On this tail ad1 are situated. Ad2 are situated off the middle of the anal lateral border, and ad3 are preanal, although a little laterally. Iad is preanal.

54(1).

Exoribatula marginata n.sp.; fig. 33.

Colour light brown. Length about 0.375 mm.

The rostrum is conical. The rostral hairs, which are located laterally, are thin and intermittently barbed, longer than their mutual distance. The lamellar hairs are thicker than the rostral hairs, also barbed, and as long as the rostral hairs. The interlamellar hairs are as long as their mutual distance and barbed. Apart from their proximal part, the lamellae are parallel and narrow. The pseudostigmatic organs are globular, the stalk no longer than the head. The pseudostigmata are hidden under the anterior border of the hysterosoma.

The straight anterior border of the hysterosoma projects beyond the pseudostigmata. Also the anterior border of the pteromorphae is straight, the shoulder rounded, and the sides of the hysterosoma almost parallel. In the latter there is a small indentation in front of p3. On the only specimen found the posterior border is a little irregular, but rounded. The hysterosoma is surrounded by a broad brim (hence the specific name). There are 10 pairs of notogastral hairs, which are almost equally thick throughout, and slightly rough. P1–p3 are a little shorter than the others and located at some distance from the border. There are four pairs of sacculi. Im is located in front of ms.

The ventral side, fig. 33a. The sternum is very narrow and hardly discernible. Apodemata II and the sejugal apodemata are parallel, Apodemata III short, and Apodemata IV absent. There are two pairs of hardly discernible genital hairs. The aggenital hairs are short. Only one anal hair on each plate, situated near the posterior end. The anal hairs and the two pairs of adanal hairs present are very long, undulating. Iad was not observed. On the ventral plate the integument is wrinkled obliquely longitudinally. More faint wrinkles can be seen on the anal plates. The sculpture of the epimeres is fainter and indistinct. Tridactylous.

51(1).

Cryptoribatula euaensis n.sp.; fig. 34.

Colour dirty, yellow-greyish. Length about 0.32 mm.

The visible part of the propodosoma is very short as compared to the longish oval hysterosoma. The very broad rostrum is bordered by a slightly undulating hyaline lip, in front of which the distal end of the mandibles and palps can be seen. When seen in a lateral view, the mandibles are uncovered, fig. 34b. The rostral, the lamellar, and the interlamellar hairs are all very long and barbed. The lamellar hairs are situated only a short distance in front of the interlamellar hairs. There are no lamellae, only a fold in the integument, fig. 34b. The interlamellar hairs are situated on either end of the straight and very indistinct dorso-sejugal suture. The pseudostigmatic organs are hidden under the pteromorphae. They are club-shaped, longish, and the club is as long as the stalk.

The hysterosoma is a regular oval apart from the straight anterior border. The shoulders or pteromorphae are narrow, rounded, and immovable. There are 10 pairs of notogastral hairs, all of them moderately long, curved, and slightly barbed. Ms and r1 are directed medially, ti posteriorly, the others radiating. There are four pairs of sacculi. The fissure im is distinct, moderately long, and situated in front of ms. The integument is smooth.

The ventral side, fig. 34a. Sternum is absent. Apodemata II and the sejugal apodemata are parallel, the former reaching the anterior border of the genital field. Apodemata III are short. Apodemata IV not developed. The epimeric hairs are distinct, most of them rather long. The genital field is longish, oval. The anterior medial border of the plates is thickened. There is only one pair of genital hairs,

situated near the anterior border. Aggenital hairs are absent. The anal field is broad and only a little longer than the genital field. There are two pairs of anal hairs, situated far behind the anterior border. The three pairs of adanal hairs are moderately long, and apparently smooth. Ad3 is preanal, ad2 and ad1 are situated laterally close behind each other. The integument is finely punctate in oblique lines as shown on the epimeres. The legs, especially the femora, have densely barbed hairs. The tarsi have only one, very strong claw.

51(2), 52(3).

Euaella n.gen., belonging within the Oribatuloidea, is characterized by the narrow propodosoma continuing evenly into the very broad hysterosoma, without dorso-sejugal suture. Rostral, lamellar, and interlamellar hairs present. 10 pairs of notogastral hairs. Sacculi indistinct. Rounded shoulders. One pair of genital hairs, no aggenital hairs, two pairs of anal hairs, and three pairs of adanal hairs. Genital field imbedded in anterior border of anal field. Monodactylous.

Euaella Gitteae n.sp.; fig. 35.

Colour dirty yellow-greyish. Length about 0.217 mm.

The anterior third of this mite is narrow, widening evenly as far as the pseudostigmata, whereafter it becomes very broad, being broadest a little in front of te. Its posterior half is broadly rounded.

The rostrum is bordered by a broad, rounded, hyaline lip, on either end of which the long, barbed rostral hairs are situated. The thick, densely barbed lamellar hairs are situated on the end of the lamellae, only a short distance behind the rostral hairs. The lamellae are very long, narrow, tapering towards the tip. The interlamellar hairs are situated where the latero-anterior margins of the hysterosoma are attached to the medial margin of the lamellae, about one third of the lamellar length from the lamellar hair. They are also densely barbed, and shorter than their mutual distance. The pseudostigmata are completely hidden below the border of the hysterosoma. The pseudostigmatic organs are club-shaped, the head longish, oval, just reaching beyond the cup, and halfway beyond the margin of the hysterosoma.

The latero-anterior border of the hysterosoma reaches as far anteriorly as the interlamellar hairs, running almost parallel to the lamellae. There is no dorso-sejugal suture. There are 10 pairs of notogastral hairs, which are rather long, and apparently smooth. Ti and ms are directed medially, the others radiating. Only two, perhaps three pairs of sacculi were observed, viz. S1, S2, and S3(?), all indistinct and very small, S3 being dubious. The fissure im is long and distinct, situated in front of ms. Ih and ips can be seen along the lateral border. The integument is smooth.

The ventral side, fig. 35a. The ventral side is very peculiar, the apodemata being directed strongly posteriorly. In this connection also the genital field is displaced as far posteriorly as possible, being pushed into the anterior border of the anal field. There is no room for the aggenital hairs, which are absent. Apodemata II and the

sejugal apodemata are parallel, both pairs reaching the sternal middle line. Apodemata III are short and situated off the middle of the sejugal apodemata, more transversally. Apodemata IV are not developed. Only a few epimeric hairs were observed. Legs IV are inserted rather far posteriorly and medially, separated from Legs III by quite a distance. The genital field is more or less rounded, its posterior border pushed into the more or less concave anterior border of the anal field, which surrounds its posterior third, being much broader. There is only one pair of genital hairs, situated near the anterior border. They appear smooth. The anal field is almost twice as broad as the genital field. It touches the posterior border of the ventral plate. There are two pairs of long, strong, barbed anal hairs and three pairs of adanal hairs. Ad1 and ad2 are situated rather close together laterally to the posterior part of the anal field. Ad3 is situated in the corner between the genital and the anal fields.

The legs are very strong and the joints, apart from the femora, short. All tarsi are monodactylous.

This species is named after my daughter Birgitte, my assistant on the expedition, who collected all the oribatids on Eua.

51(1).

Planobates n.gen.

Lamellae narrow, without cusps. No translamella. Pseudostigmatic organs club-shaped. No dorso-sejugal suture. Pteromorphae reaching all the way round the dorsum, immovable. Dorsum broad and rather flat (planus). Four pairs of sacculi, 10 pairs of notogastral hairs. One pair of genital, one pair of aggenital, two pairs of anal, and three pairs of adanal hairs. Tridactylous, homodactylous. Solenidia of all tibiae ending in a knob.

Planobates circumalatus n.sp.; fig. 36.

Colour light brown. Length about 0.355 mm.

The rostrum is slightly pointed at the tip. The slightly barbed rostral hairs are situated laterally; their tips are dull. The lamellae, located along the sides of the propodosoma, reach halfway to the tip of the rostrum. A beginning of a translamella can be seen between the end of the lamellae. The lamellar hairs are a little longer than the rostral hairs, slightly barbed, the tips dull. The interlamellar hairs are ligaments, broad, proximally hairy, tapering towards the slightly thickened tip. They are as long as the lamellar hairs, fig. 36a. Between the interlamellar hairs an indistinct line can be seen. The pseudostigmatic organs are short, clumsy, angular clubs, directed forwards, and set with minute bristles. Seen in a lateral view they are longish, fig. 36a.

There is no true dorso-sejugal suture, only a thin line behind which the integument is a darker colour than in front of the line. The hysterosoma is oval, apart from the pronounced shoulders of the pteromorphae. The latter reach the posterior end of the dorsum, fig. 36a. They are immovable. Their distal margin is whitish-yellowish. There are four pairs of sacculi and 10 pairs of notogastral hair pores, but only one pair of hairs, viz. p1. The fissures im and ip are long.

The ventral side, fig. 36b. The sternum is faintly developed. Apodemata II and the sejugal apodemata are parallel, Apodemata III shorter. The genital field is pointed anteriorly, rounded posteriorly. There is only one pair of genital hairs, situated a little in front of the middle of the plates and near the lateral border. The aggenital hairs are situated rather close together and only a short distance behind the genital field. There are three pairs of adanal hairs, of which ad3 are preanal and like the aggenital hairs separated by a short distance. Ad2 and ad1 are situated laterally to the posterior part of the anal field. The distance ad1-ad2 is half as long as ad1-ad1. The posterior anal hair is located near the medial border. The fissure iad is located at the latero-anterior corner of the anal field.

The legs are short and strong. Femora I-II with two strong barbed hairs on their dorsal side. The solenidia of all the tibiae are long and stiff, ending in a knob. Also one solenidion of Tarsus I and one of Tarsus II end in a distal knob. Tridactylous. All the claws are very strong. Fig. 36c shows Leg I.
31(2).

Ingella bicolor n.sp.; fig. 37.

Colour light brown. Length about 0.38 mm.

The present species is very similar to *I. bullager*, HAMMER 1967, fig. 62. It can, however, be distinguished from the latter by its smaller size (*I. bullager* 0.42 mm), and the smooth integument in the middle of the propodosoma (*I. bullager* wrinkled). Moreover, the hysterosoma is less square. The notogastral hairs are much shorter, the fissure im longer. In this species there is a great difference in the colour of the integument of the propodosoma and of the hysterosoma, the former being light brown, the latter much darker, especially dark immediately behind the broken dorso-sejugal suture (hence the specific name).

The hairs of the ventral side, fig. 37a, are much shorter than in *I. bullager*. The distal knob of the solenidia of the legs found in *I. bullager* was not observed.
51(1).

Oribatulidae

Zygoribatula longiporosa Hammer, 1953.

50(1).

Brassiella penicillifer n.sp.; fig. 38.

Colour brown. Length about 0.33 mm.

The propodosoma is more or less conical. The rostral hairs are situated laterally at a good distance behind the tip of the rostrum. They are very thin and perhaps slightly rough. The lamellar hairs and the interlamellar hairs, as well as the notogastral hairs, are long brushes (hence the specific name), distally densely barbed, scarcely barbed on the stalk. The costulae are curved. Off the middle of the costula an area porosa sublamellaris can be seen. Translamella is absent. In the space between the

lamellae there are many chitinous thickenings or wrinkles, the anterior ones of which are parallel to the lamellae. One is located between the lamellar hairs. Further posteriorly they are very irregular. The interlamellar hairs are situated near the pseudostigmatic cups. The latter open laterally. The pseudostigmatic organ is a longish rather thick club. The exopseudostigmatic hair is long and smooth. In front of the lamellar hairs the integument is irregularly longitudinally striated.

There are 7 pairs of long, ciliate notogastral hairs, the cilia being longest distally on the rounded hair-tip. The hairs are probably almost equally long, ti and ms being seen foreshortened. R1 is slightly longer than the others. According to BALOGH, 1970, concerning *Brassiella reticulata* (Oudms.) there are "(Probably 3 pairs of minute or reduced setae p, so that definitive number of hairs presumably 7 + 3)". BALOGH does not, however, show more than 6 pairs of long ciliate hairs. There are four pairs of sacculi. The sculpture of the dorsum consists of a reticulation of more or less hexagonal-rounded meshes in the middle of which a dark spot can be seen.

The ventral side, fig. 38a. Between the broad sejugal apodemata there is a broad transverse plate, from which issues a dark plate surrounding the genital field, reaching Acetabulum IV laterally. Apodemata II are short and narrow, Apodemata III very small. The hairs of the ventral side are hardly discernible. There are four pairs of genital hairs, no aggenital hairs. The anal field is only a little larger than the genital field. It is a lighter colour than the surroundings, and the plates are finely striated. There are two pairs of anal hairs. There are two pairs of adanal hairs, viz. ad3, which are preanal, and ad2, located at the corner between the anal field and a curved ridge surrounding the posterior border of the latter. Iad is preanal. A fine structure consisting of small tubercles in longitudinal rows can be seen on the epimeres. On the ventral plate there are indistinct light round pits.

The legs are long and slender, yellowish. Tridactylous.

44(1).

Scheloribatidae

Scheloribates praeincisus (Berlese), 1910.

30(2), 33(1), 34(2), 38(4), 40(1), 45(1), 47(2), 50(2), 56(8), 57(2), 59(1), 60(1), 62(1).

Scheloribates praeincisus (Berlese), var. *interruptus* Berlese, 1916.

29(1), 30(16), 33(1), 42(1), 47(5), 50(12), 51(2), 55(1), 79(1), 80(71).

Scheloribates praeincisus (Berlese) var. *fijiensis* Hammer, 1971.

26(2), 28(3), 40(1), 54(1), 62(1), 66(1).

Scheloribates fimbriatus Thor, 1930, var. *javensis* Willm. 1931.

33(3), 47(2), 56(1), 79(1).

Scheloribates zealandicus Hammer, 1967.

37(13).

Scheloribates latoincisus n.sp.; fig. 39.

Colour clear brown, pteromorphae and legs yellow. Length about 0.575–0.58 mm.

The tip of the rostrum is extremely pointed, the extreme tip is white. The rostral, the lamellar, and the interlamellar hairs are slightly barbed, the two latter equally long. The incision in the line between the lamellae is broad with parallel sides (hence the specific name). In front of this line the integument is brown, behind it light brown. Further anteriorly there is another transverse line. The pseudostigmatic organs are short, thick clubs with a short stalk, the head set with coarse scales, fig. 39a.

The anterior border of the hysterosoma is a low arch. Between the pseudostigma and the tip of the pteromorpha there is an incurvation. The distal part of the pteromorphae is yellowish-grey, the medial part with a brown "shadow". Fine radiating lines can be seen distally on the pteromorphae. The notogastral hairs are indiscernible, the pores indistinct and not all were observed. There are five pairs of indistinct sacculi, S1 being represented by an anterior and a posterior one.

The ventral side, fig. 39b. Apodemata II are short. Apodemata III are also short and do not reach the anterior border of the genital field as is usual within the genus *Scheloribates*. For this reason the species should perhaps be established under a separate genus. The epimeric hair 1c is situated further medially than usual. The number of hairs and the location of these on the ventral plate is typical for a *Scheloribates*. Tridactylous.

S. latoincisus can be distinguished from all so far described *Scheloribates* species by its very pointed rostrum, its broad incision in the translamellar line, its short Apodemata III, and by having five pairs of sacculi.

36(1), 39(1), 44(2), 52(2).

Scheloribates biarcualis n.sp.; fig. 40.

Colour light brown. Length about 0.575 mm.

The tip of the rostrum is rounded. The rostral hairs are much shorter than the lamellar and the interlamellar hairs, which are equally long. All of them are barbed and rather thin. On the transverse line between the lamellae there are two short arches (hence the specific name). They are not always very distinct. The lamellae are slightly striped. The pseudostigmatic organs are clavate, longish when stretched out, pointed at the end. They are set with minute bristles.

The anterior border of the hysterosoma is an even arch, and the anterior margin of the pteromorphae runs transversally. Of the notogastral hairs only p1–p3 are present, the others being represented by their pores only. There are four pairs of sacculi. The dorsal surface is finely striated longitudinally, along the posterior border transversally.

The ventral side, fig. 40a, is typical for a *Scheloribates* and a few comments are sufficient. Pedotecta I is obliquely striated. Apodemata II are shorter than the sejugal apodemata. The anal plates are striated and also the ventral plate is finely striated. In the holotype there are three anal hairs on one side, but this is anomalous. Tridactylous, the middle claw much stronger than the thin lateral claws.

This species is easily recognisable by the two arches between the lamellae and its striated integument.

26(5).

Scheloribates tubuaiensis Sellnick, 1959.

Colour mahogany red. Length about 0.84 mm.

The number of teeth on Femur II is probably variable. SELLNICK mentions three, one specimen with two only. I have found four, but not examined all the specimens found.

32(1), 36(2), 38(3), 44(4), 54(1).

Scheloribates sphaeroides n.sp.; fig. 41.

Colour mahogany red, almost black in the posterior part of the hysterosoma. The red-brown colour is limited to the almost spherical hysterosoma leaving the tip of the pteromorphae and a narrow band along the dorso-sejugal line a yellowish, light brown. This makes the dorsum appear spherical. The propodosoma is a lighter brown colour than the hysterosoma. The legs are yellowish, light brown. Length about 0.635 mm.

The tip of the rostrum is very pointed, ending sharply. The rostral, the lamellar, and the interlamellar hairs are very thin and slightly barbed, the two latter pairs twice as long as the rostral hairs. The pseudostigmatic organs are very long, thin, thickest at their middle and ending in a thread set with a few bristles, fig. 41a. They are directed backwards and outwards, reaching beyond the tip of the pteromorphae.

The anterior border of the hysterosoma forms a low broad arch. The distal tips of the pteromorphae are prominent being limited by an incurvation both anteriorly and laterally. On this tip there are a few grey folds or wrinkles. The notogastral hairs are extremely difficult to see and only those in profile were observed, viz. r1, p1-p3. The sacculi are large and light. Laterally to S1 there is a large light spot, probably gl or im.

The ventral side, fig. 41b. Apodemata II are short and thick, the sejugal apodemata and Apodemata III almost reaching the anterior border of the genital field. Only a few epiremic hairs could be seen. Of the adanal hairs only ad3 were observed. The anal field is a lighter brown colour than its surroundings. Tridactylous.

68(1).

Samoabates n.gen.

This genus has so many characteristics in common with *Scheloribates* that only differences will be mentioned. It differs from *Scheloribates* by the dorsal position of the rostral hairs, by the absence of a true prolamellar ridge, by having 14 pairs of notogastral hairs, short Apodemata III, and by being monodactylous.

Samoabates acutirostrum n.sp.; fig. 42.

Colour light brown with a darker belt across the hysterosoma. Length about 0.45 mm.

The tip of the rostrum is pointed and strongly chitinized. The rostral hairs, located on the dorsal surface, are thin and slightly uneven. The lamellar and inter-

lamellar hairs are very thin and slightly rough, and much longer than the rostral hairs. In front of the end of the lamella a ridge can be seen running forwards and disappearing before it reaches the rostral hair. In a lateral view this ridge, which is not a true prolamellar ridge, seems to be displaced more medially, fig. 42a. Between the interlamellar hairs there is an indistinct curved bridge. The pseudostigmata, which are hidden below the lamellae, have a broad lateral lobe. The pseudostigmatic organs are longish clubs set with minute bristles, the stalk is S-bent.

The anterior border of the hysterosoma is slightly convex with a deep incurvation laterally to the pseudostigmata. The pteromorphae are well developed reaching almost as far as S1, immovable. The tips of the pteromorphae, which project, are a yellowish colour. The four pairs of sacculi are all very distinct. S1 is located a little more medially than is the case in *Scheloribates*. There are 14 pairs of thin, short, smooth notogastral hairs, arranged as shown in fig. 42. The dorsal surface is smooth without any sculpture except some very fine radiating lines on the pteromorphae.

The ventral side, fig. 42b. The sternum is broad, ending posteriorly in a wide band surrounding the genital field. Apodemata II and III are very short and broad, whereas the sejugal apodemata are long and narrow. There are four pairs of genital hairs arranged in pairs, one pair at either end of the plates. There are one pair of aggenital hairs, located rather laterally, two pairs of anal hairs, and three pairs of adanal hairs. Ad3 is preanal, ad2 and ad1 are postanal, the distance ad1-ad1 being about twice as long as ad1-ad2. The fissure iad is located behind ad3.

The number of solenidia on genu, tibia, and tarsus of the legs is I(1-2-2), II(1-1-2), III(0-1-0), IV(0-1-0). Fig. 42c shows Leg I (not all the hairs of the femur are shown). Monodactylous.

This genus can be distinguished from *Multoribates* HAMMER, 1961, by its well developed pteromorphae (*Multoribates* has rounded shoulders) and by being monodactylous (*Multoribates* tridactylous).

62(1), 68(32), 69(3), 71(3).

Striatobates n.gen.

Propodosoma with lamellae without cusps. Translamella and prolamella absent. Dorso-sejugal suture present. Pteromorphae immovable. Two pairs of sacculi. 11 pairs of notogastral hairs. Notogaster with two short tubercles on posterior border. Four pairs of genital hairs, one pair of aggenital, two pairs of anal, and three pairs of adanal hairs. The integument densely striate. Tridactylous.

Striatobates tuberculatus n.sp.; fig. 43.

Colour light brown. Length about 0.495 mm.

The rostrum is conical, rounded at the tip. The rostral hairs, which are situated laterally, are thin and slightly barbed. The lamellae are almost equally broad throughout, reaching almost two-thirds of the distance to the rostral tip. Between the end of the lamellae there is a beginning of a translamellar line. The lamellar hairs are barbed

spines, reaching beyond the tip of the rostrum. The interlamellar hairs are rough spines, much thicker than the lamellar hairs and as long as the lamellae. Fig. 43a shows the propodosoma in an oblique lateral view. The side of the propodosoma is covered by a broad plate-Tutorium(?). The exopseudostigmatic hair is short. The pseudostigmata are completely covered under the anterior border of the pteromorphae. The pseudostigmatic organs are short, smooth clubs.

The dorso-sejugal suture is straight, projecting beyond the anterior border of the pteromorphae, which also are straight. The pteromorphae are short, triangular, almost one-third as long as the hysterosoma. Only a narrow brim is bent ventrally. The hysterosoma is broadest across the pteromorphae, tapering towards the posterior end on which there are two small tubercles, separated by an incurvation. In the two specimens found (both females) these tubercles are not equally well developed, the type specimen showing them best. There are 11 pairs of notogastral hairs, one pair situated on the ventral side of the tubercles. All the hairs are short and smooth. Only two pairs of sacculi were observed, viz. Sa and S1. The fissure im is short and indistinct. On the integument there are light, longitudinal stripes between darker wrinkles, on the pteromorphae arranged more irregularly.

The ventral side, fig. 43b. The sternum is faintly chitinized. The epimeric hair formula is 3-1-3-3. The apodemata are long and narrow. The sejugal apodema and Apodema III meet in front of the genital field. There are four pairs of short genital hairs and one pair of aggenital hairs. There are three pairs of adanal hairs, ad3 being preanal, ad2 and ad1 postanal. The distance ad1-ad1 is twice as long as ad1-ad2. Iad was not observed.

Fig. 43c shows the distal part of Leg I. Genus I-II have a long thin spine and a rough, curved hair. A similar hair is situated distally on Tibiae I-II. The middle claw is extremely strong compared with the two hair-thin lateral claws. Solenidia are present on all the tibiae and on Genus I-II.

63(2).

Perscheloribates n.gen.

Perscheloribates is closely related to *Scheloribates*: lamellae without cusps, pteromorphae immovable, 10 pairs of notogastral hairs, 4 pairs of sacculi, 4 pairs of genital hairs, one pair of aggenital, two pairs of anal, and three pairs of adanal hairs. It differs from *Scheloribates* by the absence of prolamella, by its short Apodemata III, and by being monodactylous.

Perscheloribates clavatus n.sp.; fig. 44.

Colour light brown. Length about 0.375 mm.

The tip of the rostrum is drawn out into a short snout. The rostral, the lamellar, and the interlamellar hairs are thin and slightly barbed. The rostral hairs, which are situated laterally, are a little shorter than the two last. The pseudostigmatic organs are short, thick clubs, apparently smooth, fig. 44a. The exopseudostigmatic hair is well developed.

The anterior border of the hysterosoma is slightly convex. The hysterosoma is broadest across Sa. The pteromorphae are short and immovable; the brim does not bend ventrally. There are 10 pairs of notogastral hair pores, but the hairs are absent. Four pairs of sacculi, S1 being located more medially than in *Scheloribates*. The fissures im and ip are long.

The ventral side, fig. 44b. The sternum is faintly chitinised. Apodemata II are short knobs. The sejugal apodemata almost reach the anterior border of the genital field as in *Scheloribates*, but Apodemata III are very short. There are four pairs of genital hairs, one pair of aggenital hairs, two pairs of anal hairs, and three pairs of adanal hairs. All these hairs are moderately long. Ad3 are preanal, ad2 and ad1 are postanal and separated by a short distance only. Pedotecta I and II are well developed. All the tibiae have a long solenidion, Genus I–II have likewise a long solenidion. Monodactylous.

30(1), 62(2), 63(1), 66(1).

Neoscheloribates n.gen.

Lamellae narrow without cusps. Prolamella present. Pteromorphae immovable; 10 pairs of notogastral hairs; three pairs of sacculi; four pairs of genital hairs; aggenital hairs absent. Apodemata III short. Tridactylous.

Neoscheloribates grandiporosus n.sp.; fig. 45.

Colour light brown. Length about 0.32 mm.

The tip of the rostrum is truncate. The rostral, the lamellar, and the interlamellar hairs are very thin and almost smooth. The interlamellar hairs are longest. Between the end of the lamellae a beginning of a translamellar line can be seen. A dark ring surrounds the base of the interlamellar hairs. Fig. 45a shows the lamellar system. An area porosa sublamellaris is situated between the sublamella and a ridge parallel to the latter. Exopseudostigmatic hair absent. The pseudostigmatic organs are clavate, short and broad, directed forwards and outwards.

The anterior border of the hysterosoma is almost straight. The anterior border of the pteromorphae is almost on level with the latter, only slightly withdrawn. The distal part of the pteromorphae is a yellow colour. The 10 pairs of notogastral hairs are distinct, moderately long, their pores longish, bright, and as large as the sacculi (hence the specific name). The sacculi, on the other hand, are small and indistinct. Only Sa, S1, and S2 were observed. The fissures im and ip are long.

The ventral side, fig. 45b. A sternum is not developed. Apodemata II and the sejugal apodemata are parallel, the latter almost reach the anterior border of the genital field. Apodemata III are short. The hair pores are large like those of the dorsal side, but most of the epimeric hairs are absent. On the genital plates there are four large pores, viz. two at either end of each plate. Aggenital hairs are absent. There are three pairs of adanal hairs of which ad3 are preanal and tiny. Ad2 and ad1 are located laterally to the posterior half of the anal field. They are moderately long like the two

pairs of anal hairs. Iad is tiny and located between ad3 and ad2. All the tarsi have three claws of which the lateral ones are no thicker than the hairs of the tarsi.

51(1).

Semischeloribates n.gen.

Semischeloribates was first found on Tahiti and described as a *Scheloribates* with a question mark attached to the generic name due to differences from *Scheloribates* (Hammer 1972, fig. 54, p. 48).

Semischeloribates is closely related to *Scheloribates* but differs by its imperfect prolamella, and its short Apodemata III. Tridactylous.

Semischeloribates imperfectus (Hammer), 1972.

30(1), 38(1), 42(18), 43(3), 44(1), 51(2), 53(1), 54(1).

Fijibates rostratus Hammer, 1971.

59(1), 68(1).

Maculobates ventroacutus Hammer, 1971.

36(1).

(?)*Maculobatus dubius* Hammer, 1971.

51(1).

Siculobata sicula (Berlese), 1892.

30(1).

Tuberemaesus indentatus n.sp.; fig. 46.

Colour light brown. Length about 0.46 mm.

The lamellar and the interlamellar hairs are long, strong, and barbed, the latter being the thickest. The sculpture of the propodosoma is very irregular, consisting of pits of different sizes and arranged irregularly. The pseudostigmatic organs are coarse with thick spines along the outer border. The spines are apparently connected by a membrane. The distal spine is longer than the others thus making the head end in a strong spine, fig. 46a.

The anterior half of the hysterosoma is broadly rounded as far as off te, where there is a small indentation in the lateral border (hence the specific name). The posterior half of the hysterosoma is a little narrower than the anterior half. The notogastral hairs are rather long. Ti, ms, and r1 are directed medially, r3 forwards and outwards, the others more or less radiating. The sculpture of the dorsum consists of minute, oblong, luminous punctures, arranged in longitudinal rows. Immediately behind the dorso-sejugal suture the punctured lines run parallel with the suture.

The ventral side, fig. 46b, is typical for the genus having a rather narrow sternum. Apodemata II are shorter than the sejugal apodemata and Apodemata III. The two last almost meet at the anterior border of the genital field. I am unable to see the two anterior pairs of genital hairs due to the open plates. There is no sculpture anywhere on the ventral side.

72(1).

Tuberemaeus perforatus (Willm.), 1931; fig. 46c.

Length about 0.38 mm.

The specimens found agree with WILLMANN, 1931, p. 268, fig. 42, having comparatively short lamellar hairs and angular shoulders. The pseudostigmatic organs, fig. 46c, however, have coarser spines on the outer border than illustrated by WILLMANN, and the luminous punctures are larger on the propodosoma than on the hysterosoma, whereas they are similarly small in the type. Also in the specimens from West Samoa the punctures are small and of the same size on the propodosoma and the hysterosoma. 57(2), 68(3).

Tuberemaeus thienemanni (Willmann), 1931; fig. 46d.

Colour light brown. Length about 0.40 mm.

The only specimen found has longer lamellar hairs than the preceding species, rounded shoulders, broader pseudostigmatic organs, the distal ends of which suddenly become narrow, ending in a spine. These features are all characteristic for *T. thienemanni*. The punctures of the hysterosoma are very small and round, those of the propodosoma larger as in the preceding species. In the type they are alike on the propodosoma and on the hysterosoma.

62(1).

Haplozetidae

Peloribates rangiroaensis Hammer, 1972.

44(1).

Rostrozetes foveolatus Sellnick, 1925.

33(2), 34(27), 38(3), 47(5), 48(1), 50(25), 52(6), 68(9), 69(6), 80(4).

Xylobates capucinus (Berlese), 1908.

34(8), 47(1), 50(7), 56(2), 80(1).

Xylobates mollicoma n.sp.; fig. 47.

Colour light brown. Length about 0.655 mm.

The rostrum is very broad. The rostral, the lamellar, and the interlamellar hairs are thin and slightly barbed, the last a little longer than the two first. The lamellae are broadest across the middle, thereafter tapering towards the tip, bending slightly

medially. In front of the lamellae there is a curved line. The pseudostigmatic organs have a small lanceolate head set with fine bristles on its outer border, the bristles being present also on the distal part of the stalk, fig. 47a.

The hysterosoma is broadest across te-te. Its anterior border is very faintly arched, almost straight, followed by an incurvation off the pseudostigmata. The latero-anterior tip of the pteromorphae forms a sharp edge. The distal tip of the pteromorphae is bent ventrally. The pteromorphae reach posteriorly as far as im. The 10 pairs of notogastral hairs are moderately long, smooth, and curved. Beside the hair pore a row of smaller pores can be seen, fig. 47b, showing r1. The areae porosae are rather large, A2 being the smallest.

The ventral side, fig. 47c. There is no true or distinct sternum, but a faint irregular chitinization from which a reticulation spreads out over all the epimeres. Apodemata II are short, the sejugal apodemata long, and Apodemata III also rather short. All the hairs of the ventral side are long, flexible, and soft (hence the specific name). There are only four pairs of genital setae. The anal hairs are knee-bent. An extra hair pore is present on the right anal plate. Ad1 and Ad2 are longer than Ad3 and reach far beyond the posterior border of the hysterosoma. Monodactylous.

33(1).

Xylobates triangularis Hammer, 1971.

52(11).

Xylobates bipilus Hammer, 1972.

47(2), 50(2).

Xylobates seminudus Hammer, 1971, fig. 48.

The only specimen found differs from the type specimen (a female 0.57 mm) by its smaller size (about 0.49 mm) and a more slender hysterosoma. To supplement the original description some detailed illustrations from a paratype have been added. Fig. 48a shows the pseudostigma and the pseudostigmatic organ. There are seven pairs of genital hairs. In the original description only five pairs of genital hairs were shown due to the two anterior ones being situated on a membrane covering the anterior part of a dark chitinous ring surrounding the genital field. These two can be seen only when the plates are laid bare, fig. 48b. There is a distinct difference in colour between the light epimeres, decorated by a reticulation consisting of angular meshes, and the darker ventral plate. In the latter light faint dots or shallow pits can be seen. Ad1 and Ad2 are situated on a narrow curved ridge behind the anal field. Figs. 48c-d show Leg I and Leg III. Tibiae II-IV have a dorsal distal tip. All the tarsi have three claws, the middle one being much stronger than the lateral ones, and thinner in Tarsus IV than in the three other tarsi. On the outer border of the middle claw there are some sharp edges and proximally on the inner border a spur. Fig. 48e shows the right palp.

55(1).

The table below lists some characteristics of the five species mentioned above:

number of	notogastral setae	genital setae	claws	tip of pseudst. org.
<i>Xylobates capucinus</i>	11	5	1	clavate
– <i>mollicoma</i>	10	4	1	clavate
– <i>triangularis</i>	10	5	1	clavate
– <i>bipilus</i>	10	5	3	clavate
– <i>seminudus</i>	10	7	3	clavate

As the five species mentioned above do not have the same number of notogastral setae, of genital setae, or of claws they probably represent several independent genera, but since I see no coherence between the number of notogastral setae, the number of genital setae, or the number of claws I prefer so far to establish all of them under *Xylobates*.

Neither JACOT, 1929, who established *Xylobates* with *Oribates lophothricus* Berl., 1904, as the type species, nor BERLESE mentions the number of genital setae. BERLESE: pedibus uniunguiculatis. *Xylobates lophothricus* (Berl. 1904, p. 27, fig. 48) has four moderately long hairs at the posterior end of the hysterosoma, and the pseudostigmatic organs are ciliate without a swollen tip. None of the species examined here agrees with these features.

Polyxylobates n.gen.

The general appearance is much like that of *Xylobates* with lamellae, slender pseudostigmatic organs, dorso-sejugal suture, movable pteromorphae projecting beyond the outline of the propodosoma, four pairs of areae porosae, one claw. It differs by having 12 pairs of notogastral setae combined with five pairs of genital hairs.

Polyxylobates diversiporosus n.sp.; fig. 49.

Colour brown. Length about 0.80 mm.

The propodosoma is conical and posteriorly not narrower than the hysterosoma. At the tip of the rostrum there is a broad rounded hyaline "lip". The rostral hairs, situated on the dorsal side, are slightly uneven. They are about half as long as the lamellar hairs. The latter are shorter than the interlamellar hairs, both pairs are uneven. The lamellar hairs are situated at the tip of the lamellae, in the corner between the lamella and its short medial prolongation, fig. 49a. Seen in a dorsal view, the lamellae are very broad proximally, tapering towards the tip. The pseudostigmatic organ is slender with a flat lanceolate head, ending in a thin thread. The head is set with tiny bristles on its outer border, fig. 49b.

The anterior border of the hysterosoma is almost straight, whereas the anterior border of the pteromorphae is slightly concave and the latero-anterior tip is sharp and projecting. The pteromorphae are rather short and do not reach as far as im. They are

mobile. The hysterosoma is broadest a little behind Aa–Aa and does not taper much towards the posterior end, which is broadly rounded. The four pairs of area porosae are of very different sizes and shapes, Aa being S-shaped seen in a dorsal view, but straight when laid bare, although the medial end is slightly bent and thickened, fig. 49c. A1 is almost round and rather small. A2 and A3 very long and narrow, A3 almost twice as long as A2. There are 12 pairs of hair pores, i.e. more than in *Xylobates* (hence the generic name). The hairs are absent or indiscernible apart from p2 and p3. Beside the pore there is a long undulating continuation of the pore, fig. 49a.

The ventral side, fig. 49d. The sternum is hardly developed and runs more or less into one with the reticulate Epimeres I–II. Apodemata II are short, the sejugal apodemata long and reach the genital field. Apodemata III are rather long, but do not meet the sejugal apodemata at the border of the genital field. The epimeric hairs: 3–1–3–3 are long, soft and curly. There are five pairs of genital setae, viz. three in an oblique row at the anterior end and two near the posterior end of the plates, fig. 49e. The aggenital hairs are almost as long as the anal and the adanal hairs. Ad1 and Ad2 are situated on a faint ridge behind the anal field. All the femora are broad with strong, stiff setae on their dorsal side. The tarsi are monodactylous. Solenidia are present on Tibiae I–IV and on Genus I–II. The palp is bifid like that of *Xylobates*. 34(2), 35(1).

Perxylobates vermiseta (Balogh & Mahunka), 1968.
47(1), 50(2), 80(1).

Galumnidae

Galumna flabellifera Hammer, 1958.
36(2), 80(10).

Galumna euaensis n.sp.; fig. 50.

Colour light brown to brown, darker in the posterior part of the hysterosoma. Length about 0.925 mm.

The rostrum is broad, its tip drawn out into a rounded tongue. The rostral hairs are smooth. The lamellae project with a short free tip on the sides of the propodosoma forming a sharp edge behind which the lamellar hairs are situated. The smooth lamellar hairs reach halfway to the tip of the rostrum. A lateral view shows that they are located between the lines L and S, close to L, fig. 50a. Both the lamellar line and the sublamellar line are very distinct. The interlamellar hairs, which are longer than their mutual distance, are rigid spines set with bristles. The areae porosae dorso-sejugales are proportionately small. The pseudostigmatic organs are very short and thin, provided with a tiny head set with minute bristles.

The dorso-sejugal suture is straight at the middle, sloping slightly towards the sides. The pteromorphae are a light brown colour with greyish confluent spots in their anterior part and dark ribs in their posterior part. The fissure is broad. The areae

porosae are very different, Aa right-angled opening posteriorly. The two branches are almost equally long, the lateral one apparently narrower and straighter than the median one. A1 is kidney-shaped, its posterior border being oval. A2 and A3 are longish and irregular in shape. The notogastral hairs are absent, their pores are distinct. Besides the hair pores there are a few other pores, i.e. behind te. The fissure im is located obliquely in front of A1. Ih laterally to A1, and ip behind A3. On the integument there are many scales especially behind Aa. In the middle of the posterior border there is a small furrow.

The ventral side, fig. 50b. Apodemata II and III and the sejugal apodemata are almost equally long, parallel, and narrow. Only three pairs of epimeric setae were observed. There are six pairs of genital hairs, of which the five anterior pairs are fairly long. The posterior one was not observed, only its small pore. Iad is located off ad3 adjacent to the anal field. The distance ad1-ad2 is a little longer than ad1-ad1. On either side of the ventral plate there is a light furrow (fold?), the posterior end of which almost reaches ad2. No area porosa postanal is was observed.

All the tarsi have three claws, the lateral ones being about half as strong as the middle claw.

52(10).

Galumna planiclava n.sp.; fig. 51.

Colour light brown. Length about 0.42 mm.

The rostrum is broad, its sides forming a right angle. The rostral hairs are short and smooth. Lamellar hairs are absent. Their pores can be seen ventrally to a faint lamellar line, fig. 51a. The interlamellar hairs are hardly discernible. The pseudo-stigmatic organs have a very long stalk and a flat head, the anterior border of which runs into one with the stalk, whereas the posterior border widens, thus forming an asymmetric club, fig. 51b, set with minute bristles. The dorso-sejugal suture is rather indistinct. Drop-shaped areae porosae dorso-sejugales present. The propodosoma is a slightly darker colour than the hysterosoma.

The hysterosoma is broadly rounded posteriorly. The pteromorphae are yellowish-grey. In their anterior part there is a large light spot, behind which the double pore for ta is located. The fissure is very distinct. No ribs are developed. Aa is kidney-shaped being slightly concave medially. It is more than twice as large as the others. A1 and A2 are round and approximately of the same size, A3 longer and larger. The notogastral hairs are absent, their pores are double and very distinct. The fissure im is situated far medially, behind ti. The gland gl can be seen laterally to A1. In the posterior part of the hysterosoma there is a small pore.

The ventral side, fig. 51c, is a light yellowish-brown colour, the epimeres with light alveoli. Four pairs of epimeric hair pores were observed. The hairs are absent. There are six pairs of genital hair pores, viz. two on the anterior border and four in a longitudinal row. The genital and the anal fields are surrounded by a dark brim. The anal and the adanal hair pores are apparently double, although it is not possible to see

two pores for all the hairs. Iad is adjacent to the anal field. Area porosa postanal is fairly large and oval. A faint curved ridge half surrounds the anal field issuing from a.p. postanal and proceeding forwards on both sides.

All the tarsi have three claws, the lateral ones being much thinner than the middle claw.

33(36), 34(1), 50(14).

Pergalumna bryani (Jacot), 1934; fig. 52.

Colour brown. Length about 0.60 mm.

The specimens found agree in almost all details with JACOT's description of the type from Hawaii. They differ only in having longer interlamellar hairs. The genital hairs located in a zigzag, as shown by JACOT, are similarly placed in the specimens found by me. A narrow oblong area porosa postanal is present.

51(5), 52(1), 59(1).

Pergalumna hawaiiensis (Jacot), 1934.

The specimens found measure from 0.58 to 0.59 mm.

30(1), 37(2), 51(2).

Pergalumna bimaculata n.sp.; fig. 53.

Colour chestnut brown. Length about 0.72 mm.

The propodosoma is very broad proximally, the lamellae rather narrow and not covering the sides of the propodosoma. The sides of the rostrum are slightly concave, the rostrum conical, a little pointed. The rostral hairs are absent. The lamellar hairs, which reach the tip of the rostrum, are smooth. They are situated medially to the lamellar line L, fig. 53a, in a dorsal view on a small elevation. The interlamellar hairs are minute. They are situated beside their pore and at a good distance from the lamellae. A dark band runs from the interlamellar hairs to the pseudostigmata. The pseudostigmatic organs are short, thread-shaped and extremely finely feathered.

There is no dorso-sejugal suture. The hysterosoma is almost circular. The pteromorphae are a dark brown colour, the fissure is light brown, located in a light brown area reaching the distal margin of the pteromorpha. In front of this light area there is an oblong light spot with a very well defined posterior border, the pteromorpha thus having two light spots, the fissure included. Ta is situated off the middle of the anterior spot. Aa is removed from the side of the hysterosoma. It is slightly oblong, and not larger than A1 and A3. In the middle of the dorsum there is a large pore. Many round holes can be seen along the posterior border. Im is located in front of A1. Notogastral hairs are absent, and not all their pores were observed.

The ventral side, fig. 53b, is a dark brown colour apart from the area between the camerostoma and the hatched line in front of the yellowish genital field. There are six pairs of fairly long genital hairs, which issue beside their pore. The aggenital, the anal, and the adanal hairs are extremely small. Iad is located close to the anal field, behind ad3. No area porosa postanal was observed.

All tarsi have three almost equally long, strong claws.

This species can be distinguished from *P. bifissurata* Hammer, 1972, which also has two light spots on the pteromorphae, by its broad rostrum (*P. bifissurata* very pointed).

28(1), 51(3).

Pergalumna remota (Hammer), 1968 (= *Allogalumna remota*).

52(4).

Pergalumna foveolata n.sp.; fig. 54.

Colour of the only specimen found, a young individual, light brown. Length about 0.52 mm.

The rostrum is very broad, the tip slightly protruding, which can best be seen in a lateral view. The rostral, the lamellar, and the interlamellar hairs are rather strong and barbed. The two last pairs a little longer than the rostral hairs. The lamellar line, and the sublamellar lines are parallel. The lamellar hairs are situated medially to the lamellar line L. The pseudostigmatic organs are thread-shaped, set with minute bristles. The area porosae dorso-sejugales are very small. The dorso-sejugal suture is absent. A distinct line can be seen in front of the interlamellar hairs.

The hysterosoma is rounded posteriorly. The pteromorphae have a deep incision in their distal margin and dark irregular ribs over most of the surface. The integument is densely punctate between the ribs. Ta is located near the fissure. The notogastral hairs are absent. The position of the pores can be seen from fig. 54. Due to the youth of the specimen, the areae porosae are not well defined, but Aa and A1 are apparently round and approximately equally large. Also A3 seems to be round and as large as Aa and A1. Im is located in front of A1, the gland immediately behind im. In the middle of the dorsum behind ms there is a small indistinct pore(?). The integument is distinctly pitted, the pits, however, being small and easiest seen along the sides of the hysterosoma. The integument is densely punctate between the pits.

The ventral side, fig. 54a. There are six pairs of genital hairs, the hairs apparently issuing beside their pore. Iad is located close to the side of the anal field. Ad3 is situated in front of iad, ad1 and ad2 are postanal. No area porosa postanal is observed. On the ventral plate there is a narrow ridge, which half surrounds the anal field from the posterior end.

All the tarsi are tridactylous, the lateral claws being considerably thinner than the middle claw.

52(1).

Acrogalumna ventralis (Willm.), 1931.

(= *Galumna duplicata* Hammer, 1958, fig. 114).

60(2).

Neogalumna n.gen.

Body rounded. Lamella and sublamella present. Lamellar hair located between L and S. True areae porosae. Fissure in pteromorphae present. Pteromorphae rounded anteriorly. 10 pairs of notogastral hairs, visible on the posterior border. Six pairs of genital hairs. Iad removed from anus. All tarsi tridactylous, heterodactylous. Mandibles normal.

Neogalumna antenniger n.sp.; fig. 55.

Colour brown, the pteromorphae light brown. Length about 0.37 mm.

The rostrum is broadly rounded. The rostral hairs, situated dorsally in front of a transverse ridge, reach for most of their length beyond the tip of the rostrum. The lamellar hairs, situated between L and S, are curved, longer, and thinner than the rostral hairs (the right one drawn from another specimen). Interlamellar hairs are absent. The pseudostigmatic organ has a very long, thin stalk and a short spindle-shaped head ending in a short tip. The dorso-sejugal suture is double and straight. The area porosa dorso-sejugal is oval.

The hysterosoma is as long as it is broad. In the posterior border there is a hardly discernible furrow. The posterior part of the pteromorphae is darker than the anterior part. The fissure is short. In the dark broad spots covering the pteromorphae there is an extremely fine network of dark and light lines, perhaps punctate lines. The hair ta was not observed only its pore. There are four pairs of areae porosae, Aa being round and the largest. A1 and A3 are round and equally large. A2 is smaller. There are 10 pairs of notogastral hairs, but only those seen in profile on the posterior border are visible. Im is located laterally to A1.

The ventral side, fig. 55b. The epimeres are a lighter colour than the ventral plate, which is dark brown. There are four large alveoli between the camerostoma and the genital field. The anterior border of the latter is tongued. There are six pairs of genital hairs, viz. two on the tongued border and four in a longitudinal row, the anterior of these located more laterally. The aggenital, the anal, and the adanal hairs are visible, but very short and thin. Ad3 is situated off the anterior border of the anal field. Ad1 and ad2 are postanal, the distance ad1-ad2 only half as long as ad1-ad1. The position of iad off ad3, but far more laterally, makes this new genus different from *Galumna* von Heyden. The area porosa postanalis is small. All the tarsi are tridactylous, the lateral claws very thin.

68(4), 69(8).

Disparagalumna n.gen.

Disparagalumna belongs to the Allogalumnoïd-Type (Balogh, 1972), the L-line being absent. By the presence of notogastral setae and tridactylous legs, it differs from *Leptagalumna*, which has notogastral setae but is monodactylous. Areae porosae dorsales of very irregular shape. Six pairs of genital hairs. Iad is located transversally off the anterior border of the anal field. Area porosa postanalis long and narrow.

Disparagalumna tongaensis n.sp.; fig. 56.

Colour light brown. Length about 0.655 mm.

The rostrum is broad, conical. The rostral, the lamellar, and the interlamellar hairs are equally long and apparently smooth. The lamellar line is absent, fig. 56a. The pseudostigmatic organs are thin, spindle-shaped, the head very narrow and set with minute bristles, fig. 56b. Dorso-sejugal suture absent. Area porosae dorso-sejugales very distinct.

The hysterosoma is longer than broad, its posterior half semicircular. The pteromorphae are a light yellowish colour. The ribs are faintly developed. The hair ta is present. The areae porosae of the dorsum are very irregular. There are two Aa, one anterior and one posterior. Aa a is divided into two lobes, the anterior one being narrow and directed forwards, the posterior or medial one is broader and directed medially. In the other specimen found Aa a is separated into three pores, fig. 56c. Aa p is much smaller and round. A1 is very irregular, more or less square with medial tongues. A2 is oval and smaller than A1, and A3 very long, as broad as A2, tapering medially. The notogastral hairs are present, but hardly discernible. They are situated a little asymmetrically. The hair pores are double. Gl is apparently located in front of A1, and im laterally to A1. A few holes can be seen in the integument, i.e. behind Aa p, and in front of A1. In the middle of the posterior border of the hysterosoma a small indentation can be seen, best in a ventral view, fig. 56d.

The ventral side, fig. 56d, is a light brown colour and no light alveoli can be seen. There are five pairs of epimeric setae. The genital setae, six pairs, are well developed. The distance between the first two in the longitudinal row is longer than that between the two posterior ones. Iad is located transversally off the anterior border of the anal field and in front of ad3. The aggenital, the anal, and the adanal hairs are approximately equally long and smooth. Area porosa postanalis is very narrow. All the tarsi have three claws, the lateral ones being almost half as thick as the middle claw. 52(2).

Allogalumna upoluensis n.sp.; fig. 57.

Colour brown. Length about 0.36 mm.

The rostrum is slightly protruding. The rostral, the lamellar, and the interlamellar hairs are absent. Lamellar line absent, sublamella present. The pseudostigmatic organs have a long thin stalk and a smooth drop-shaped head, fig. 57a. Areae porosae dorso-sejugales present. The dorso-sejugal suture is absent.

The posterior half of the hysterosoma is semicircular with a low furrow in its middle. Aa is very large, round or slightly oval. A1, which is also round, is only half as large as Aa, A2 is yet a little smaller. A3 was not observed. There is a small pore in the middle of the dorsum between A2. Im is located between ti and ms. All notogastral hairs are absent, and the pores of those on the posterior end could not be seen.

The ventral side, fig. 57b. The area between the camerostoma and the genital field is a lighter colour than the ventral plate, which is brown. There are six pairs of

genital hairs, viz. three on the anterior border, two in the middle of the plates, the pores of which are dark and distinct, and one on the posterior border with a much smaller pore. Iad is adjacent to the anal field. Ad3 is located a little in front of iad, ad1 and ad2 are postanal. There is a small area porosa postanal. All tarsi are tridactylous, the lateral claws shorter and much thinner than the middle claw.
68(1).

Seen in a dorsal view this species has many features similar to those of *Galumna samoensis* Jacot, 1924, figs. 1–12. It differs, however, in its indistinct or absent dorso-sejugal suture, ta's position near the fissure ("pore very much anterior to groove" JACOT), its large Aa, the presence of both A1 and A2 (JACOT shows only A1), its pore in the middle of the dorsum (JACOT illustrates a semilunar line), and in the position of the epimeric setae.

The specimen that I found in Viti Levu, Hammer, 1971, fig. 38, and identified as *Galumna samoensis* Jacot differs from *G. samoensis* on re-examination, and must represent a separate species, which I here establish as *Galumna fijiensis* n.sp. This has the characteristics shown in fig. 38 and 38a, i.e. rostral, lamellar, and interlamellar hairs absent; lamellar hair pores located between L and S; the pseudostigmatic organs with a drop-shaped head on a thin stalk; dorso-sejugal suture present; ta near the fissure; all areae porosae small and round; im between ti and ms; six pairs of genital hairs, i.e. three on the anterior border, well developed, two in a row in the middle line and one on the posterior border (in fig. 38a the posterior one is not shown. A dark spot behind the three anterior ones was erroneously taken for a hair); all tarsi tridactylous, the lateral claws very thin.

Composition and Distribution of the Oribatid Fauna in the Pacific Area

In the present investigation of Tongatapu, Eua and Upolu a total of 124 species was found, of which 54 are new to the science. 15 new genera were established. The species found were distributed as follows: 73 on Tongatapu, 40 on Eua, and 58 on Upolu—many are common to the three islands. On the basis of these figures, there being many more species on the Tonga Islands, Tongatapu and Eua (a total of 113), than on West Samoa (58 species), it is impossible to conclude anything about the possible significance of the geology, climate or vegetation for the composition of the fauna. For this purpose the collection is far too fortuitous—in the main as a result of the lack of time. The rather poor numbers of species found on Upolu is presumably due to the fact that the majority of the samples was taken in the mist-covered forests of the mountains and only few along the coast, since at that time I did not know from experience that the very damp biotopes in the forests are very poor in species. It is remarkable that in only two samples from Eua not less than 40 species were found. Several of these, mainly within the Oripodidae, were not found elsewhere.

There are 28 species common to the Tonga Islands and West Samoa. Furthermore 15 of these are known from Viti Levu, the Fiji Islands, and 23 from Tahiti. The relationship between the different islands is, however, more far-reaching since Fiji has 32 species common with the Tonga Islands/West Samoa, and Tahiti 45 species in common with these islands. The idea of many endemic species on the different islands is thus crumbling.

To gain an impression of the distribution of the oribatid fauna in the southern Pacific Ocean and the adjacent areas of land, all species (disregarding varieties) found twice or more times on the islands investigated, or additionally in countries closely connected with the Pacific, are arranged in the following table. To simplify the list, cosmopolitan species are omitted (*Trhypochthonius excavatus*, *Microzetes auxiliaris*, *Tectocephus velatur*, *T. minor*, *Oppiella nova* and *Hydrozetes lemnae*). The information in the table is chiefly based on my own investigations of the first five islands listed, as well as South America, but additionally on the works of AOKI (Japan, Hawaii, Thailand), BALOGH (Indonesia, Thailand-Vietnam, Africa), BECK (South America), BERLESE (Indonesia), JACOT (South-east Pacific, Hawaii, North America), MAHUNKA (Thailand-Vietnam), SELLNICK (Indonesia, South-east Pacific), WALLWORK (Africa), and WILLMANN (Indonesia).

Since the more recent investigations (listed in the table from New Zealand to Tahiti as well as South America) aimed at registration of all species found, while the majority of the other investigations outside the areas I have examined are based on registration of new species, and in older times were often carried out without modern collecting methods, it is impossible to make a satisfactory direct comparison between my own investigations and those of others. However, the first five columns in the table span a very wide area in the south Pacific Ocean: from New Zealand in the south-west to Tahiti in the east.

From the table it appears that species common to Fiji, the Tonga Islands, West Samoa and Tahiti compose a solid core of Oceanic species, a core that will be enlarged each time a new investigation is carried out in the Pacific, when several already described species inevitably will be found again.

Giving a graphical display of the total number of species for each island in columns (only the first five of the columns in the table are included) and showing the percentage which the common species of each island comprises of the total number of species of the island in question, it appears that the common mass of Fiji, Tonga, West Samoa and Tahiti comprises c. 60% of the total number of species of each individual island. This shows that the fauna of these islands is very uniform.

This mass of common species has offshoots to many parts of the Pacific area and outside this. The greatest affinity, 21 common species, is found with the fauna of Indonesia, but even such far-lying areas as Thailand-Vietnam, Japan and South America have some species in common with Oceania.

The oribatid fauna of the Pacific area is represented by a large number of families. This indicates that the fauna has not developed from a few individuals fortuitously carried to the area by ocean currents, from which developed species specific to each island, island group or island area, such as is emphasized by Gressitt (1960) regarding the insects on Hawaii: "The native insects of Hawaii, though numbering between five and ten thousand species, belong to only 103 families. This is hardly more than one-tenth of the existing families of insects. Even some families with 40.000 world species are lacking in Hawaii. Moreover, the number of genera of native Hawaiian insects is not much more than double that number and all native insects are said to be descended from only 240 natural introductions".

The oribatid fauna of Oceania with representatives from many parts of the southern hemisphere, the majority apparently from Indonesia, could indicate that some of these can have been carried with the Polynesians on their early journies far over the ocean to the different island groups, and later spread further by trading. However, one cannot ignore the fact that since the creation of the islands the sea at intervals of years can have washed individuals ashore, thereby part of the fauna may be as old as the islands themselves. Thorough information about the oribatid fauna from numerous island groups and surrounding areas is still lacking and this is needed before getting nearer the question of the origin of the oribatid fauna in the Pacific Ocean.

Table showing species common to islands in the Pacific Ocean and adjacent areas

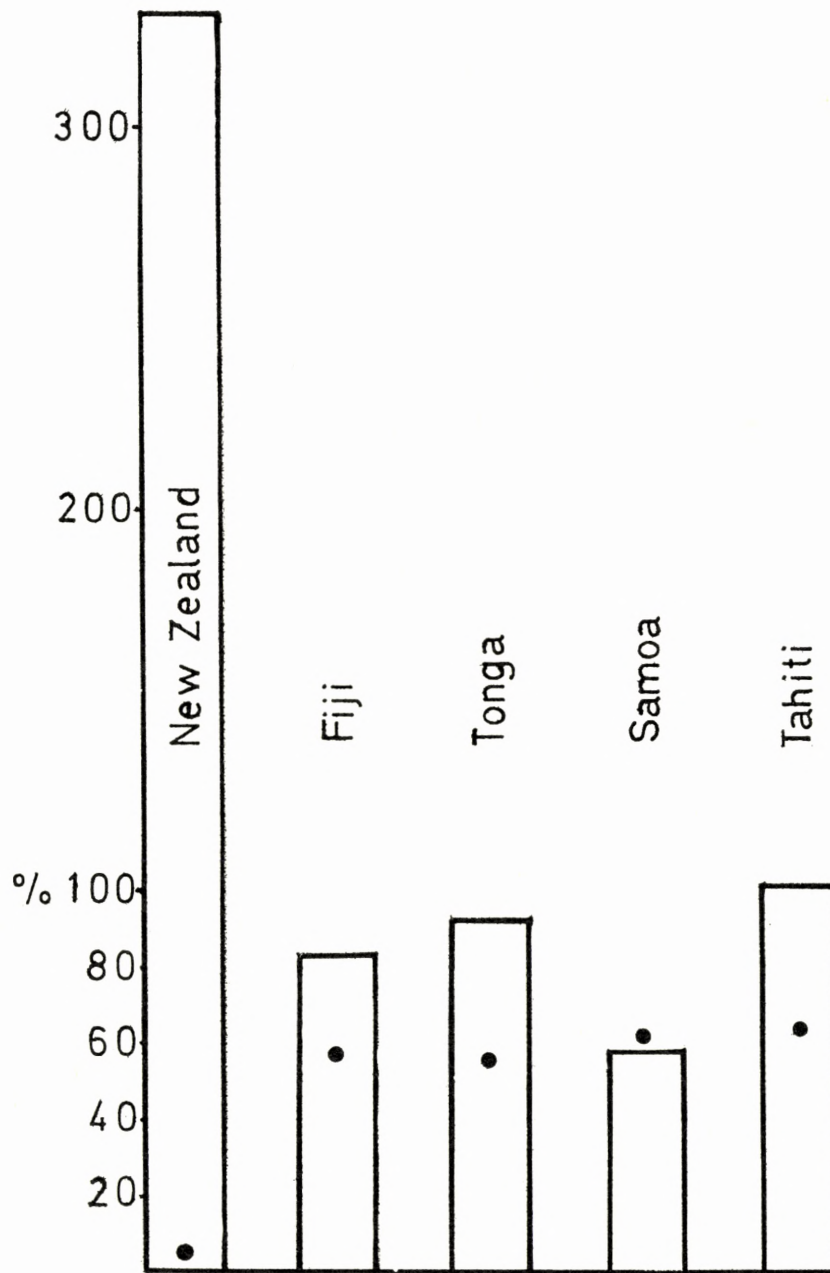
Species known from islands in the Pacific Ocean and adjacent areas of land	New Zealand	Fiji Is.	Tonga Is.	West Samoa	Tahiti	Southeast Pacific	Indonesia	Thailand-Vietnam	Hawaii	Japan	South America	North America	Africa
<i>Andacarus ligamentifer</i>	×				×								
<i>Malaconothrus remigera</i>		×		×	×		×				×	×	×
<i>Hypochthoniella minutissima</i>	×				×					×		×	
<i>Eohypochthonius gracilis</i>		×			×					×	×	×	
– <i>gr. var. crassisetiger</i>					×					×		×	
<i>Phthiracarus insularis</i>					×	×				×			
<i>Hoplophthiracarus siamensis</i>			×		×			×					
– <i>kugohi</i>		×								×			
<i>Hoplophorella scapellata</i>			×	×	×			×					
– <i>glauca</i>			×	×	×								
– <i>cucullata</i>		×						×		×	×	×	
<i>Microtritia tropica</i>					×	×					×		
<i>Rhysotritia ardua</i>			×	×	×	×				×		×	
<i>Austrotritia lebronneci</i>			×	×	×	×		×				×	
<i>Indotritia sellnicki</i>					×			×					
<i>Epilohmannia pallida</i> var. <i>pacifica</i>			×	×	×				×				×
<i>Papillacarus hirsutus</i>			×		×					×			
<i>Javacarus kühneli</i>		×			×		×						
<i>Meristacarus tahitiensis</i>			×		×								
<i>Phyllhermannia pacifica</i>			×		×								
<i>Nothrus oceanicus</i>			×	×	×	×							
<i>Allonothrus schuilingi</i>			×	×	×								
– <i>russeolus</i> var. <i>reticulatus</i>		×	×	×	×								×
<i>Cyrthermannia luminosa</i>		×			×								
<i>Archegozetes magnus</i>			×				×						
– <i>longisetosus</i>					×			×			×		
<i>Masthermannia mammillaris</i>		×	×	×	×		×						
<i>Hermannella punctulata</i> var. <i>columbiana</i>		×	×			×				×		×	
<i>Malaconothrus hexasetosus</i>		×	×	×	×								
<i>Trimalaconothrus crassisetosus</i> var. <i>fijiensis</i>		×			×		×						
<i>Liodes bataviensis</i>			×	×	×	×	×						
<i>Pedrocortesella gymnonotus</i>	×		×	×									
– <i>sempilosus</i>	×	×											
<i>Tegeozetes tunicatus</i>		×					×			×			
<i>Tegeocranellus laevis</i>		×										×	
<i>Eremulus curviseta</i>		×	×	×	×								
– <i>truncatus</i>		×	×										
– <i>averifer</i>					×		×	×		×			
<i>Fosseremus quadripertitus</i>	×	×			×			×		×	×	×	
<i>Gibbicepheus frondosus</i>		×						×		×			

Table (continued)

Species known from islands in the Pacific Ocean and adjacent areas of land	New Zealand	Fiji Is.	Tonga Is.	West Samoa	Tahiti	Southeast Pacific	Indonesia	Thailand-Vietnam	Hawaii	Japan	South America	North America	Africa
<i>Siculobata sicula</i>			×			×							
<i>Tuberemaeus perforatus</i>				×	×		×						
– <i>thienemanni</i>				×			×						
<i>Rostrozetes foveolatus</i>	×	×	×	×	×		×			×	×		×
<i>Peloribates rangiroaensis</i>			×		×								
<i>Xylobates capucinus</i>	×	×	×	×	×						×	×	
– <i>triangularis</i>		×	×										
– <i>bipilus</i>			×		×								
– <i>seminudus</i>		×	×		×								
<i>Perxylobates vermiseta</i>			×	×	×		×						
<i>Haplozetes quadripilus</i>		×					×			×			
<i>Protoribates monodactylus</i>		×								×		×	
<i>Galumna flabellifera</i>		×	×	×	×			×	×		×		
– <i>fordi</i>		×							×				
<i>Pergalumna bryani</i>			×	×		×	×		×				
– <i>hawaiiensis</i>			×			×			×				
– <i>remota</i>	×		×						×				
<i>Acrogalumna ventralis</i>				×	×		×				×		
Total 98 species	18	49	53	36	64	16	21	14	7	16	18	9	7

1) found in Queensland, Australia.

Investigating what rôle New Zealand can have played for the oribatid fauna in the Pacific area, it appears from the graphical display that the species which New Zealand has in common with Oceania only comprise 5% (18 species) of the oribatid fauna of New Zealand. Of these 18 species, many have a distribution reaching far beyond the Pacific Ocean area (see the table) and thus are not truly native to New Zealand. Only a single species of the many apparently endemic species of New Zealand was found in the present investigation: *Adhaesozetes Barbarae* on Tongatapu. In Tahiti, which was investigated just as thoroughly as New Zealand (114 samples with c. 9500 individuals from a relatively small area as against 209 samples with c. 19.000 individuals), the number of common Oceanic species comprised 61%, in New Zealand it was 5%. This seems to a great extent to confirm the idea that I proposed during my work with the oribatid fauna of New Zealand: that affinity should be sought in the sub-Arctic islands and in South America. Thus New Zealand has many species, not found in the Pacific area, in common with South America and some few



The ordinate axis indicates the total number of species found on each island (columns). The black dots show the percentage of common species in the total number of species of each island.

very characteristic species that additionally are only found in South America hitherto. These species must be older than the great mass of apparently endemic species that have developed in New Zealand after it was detached from Antarctica—South America by continental drift and isolated in the Pacific ocean. Several of the genera that for the present must be considered as endemic are represented by a large number of species. These genera and species have obviously been unable to spread to areas outside New Zealand—whatever the reason.

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Explanations of the Figures on Plates I–XXIX

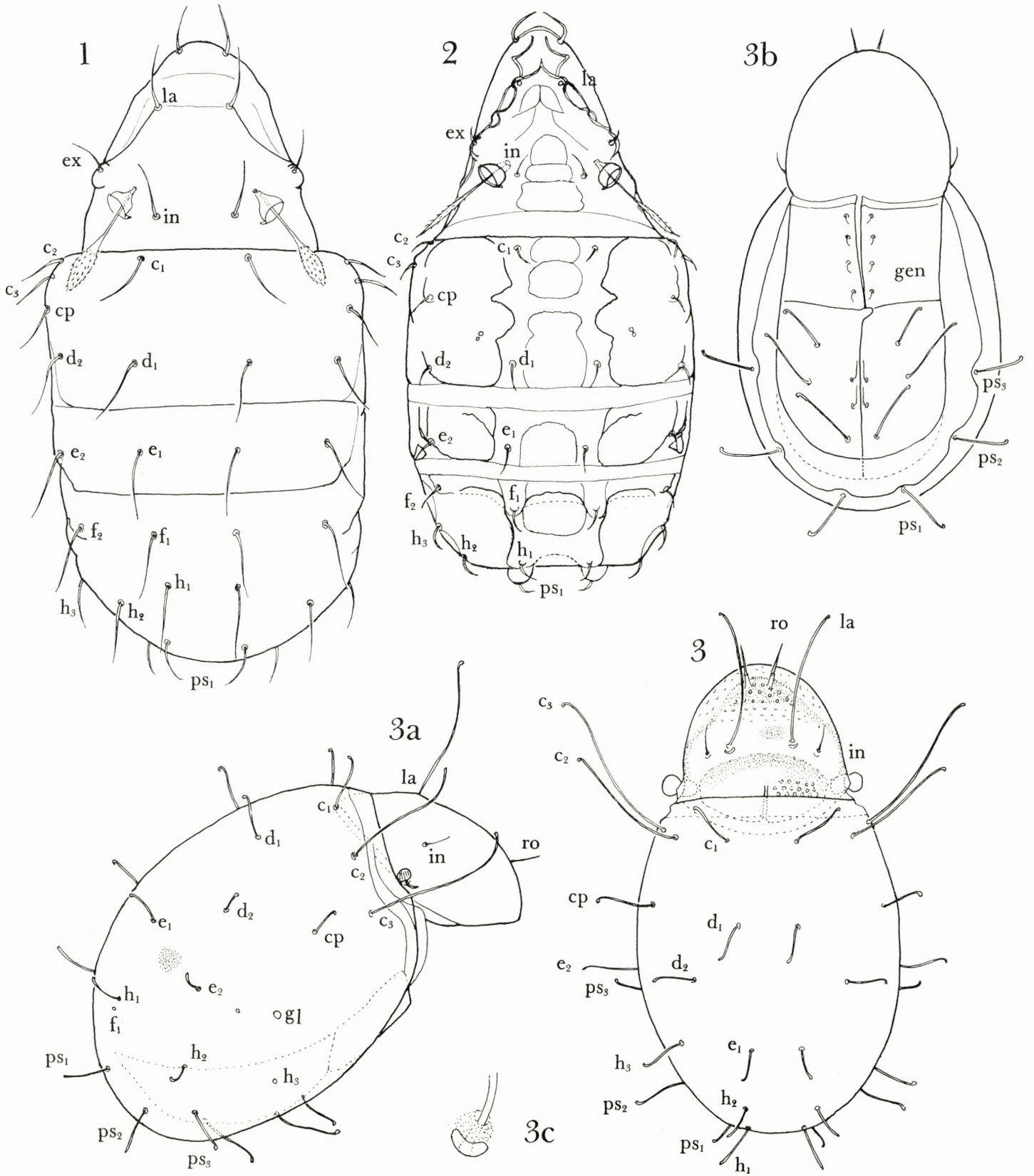
- Fig. 1. *Liochthonius oceanicus* n. sp.
 – 2. *Brachychthonius pacificus* n. sp.
 – 3. *Phthiracarus hamatus* n. sp.
 – 3a. – – lateral view.
 – 3b. – – ventral view.
 – 3c. – – part of notogastral hair with pore.
 – 4. *Tongacarus marginatus* n. gen., n. sp.
 – 4a. – – ventral view.
 – 4b. – – part of ano-genital region.
 – 5. *Annectacarus unilateralis* n. sp.
 – 5a. – – ventral view.
 – 6. *Neotrichacarus plumosus* n. gen., n. sp.
 – 6a. – – ventral view.
 – 7. *Malaconothrus cornutus* n. sp.
 – 7a. – – ventral view.
 – 8. *Plasmobates acutirostrum* n. sp.
 – 8a. – – ventral view.
 – 9. *Austrocarabodes alveolatus* n. sp.
 – 9a. – – notogastral hair.
 – 9b. – – ventral view
 – 10. – *falcatus* n. sp.
 – 10a. – – pseudostigmatic organ.
 – 10b–c. – – notogastral hairs in different views.
 – 10d. – – ventral view.
 – 10e. – – Genu I.
 – 11. *Gibbicepheus novus* n. sp.
 – 11a. – – ventral view.
 – 12. *Compactozetas hastatus* n. sp.
 – 12a. – – anterior part of ventral side.
 – 13. *Oppia exigua* (Hammer).
 – 14. *Amerioppia octocoma* n. sp.
 – 14a. – – ventral view.
 – 15. – *decemsetosa* n. sp.
 – 15a. – – ventral view.
 – 16. *Machuella lineata* n. sp.
 – 17. *Dampfiella euaensis* n. sp.
 – 17a. – – ventral view.
 – 18. *Dolicheremaeus euaensis* n. sp.
 – 18a. – – pseudostigmatic organ.
 – 18b. – – ventral view.

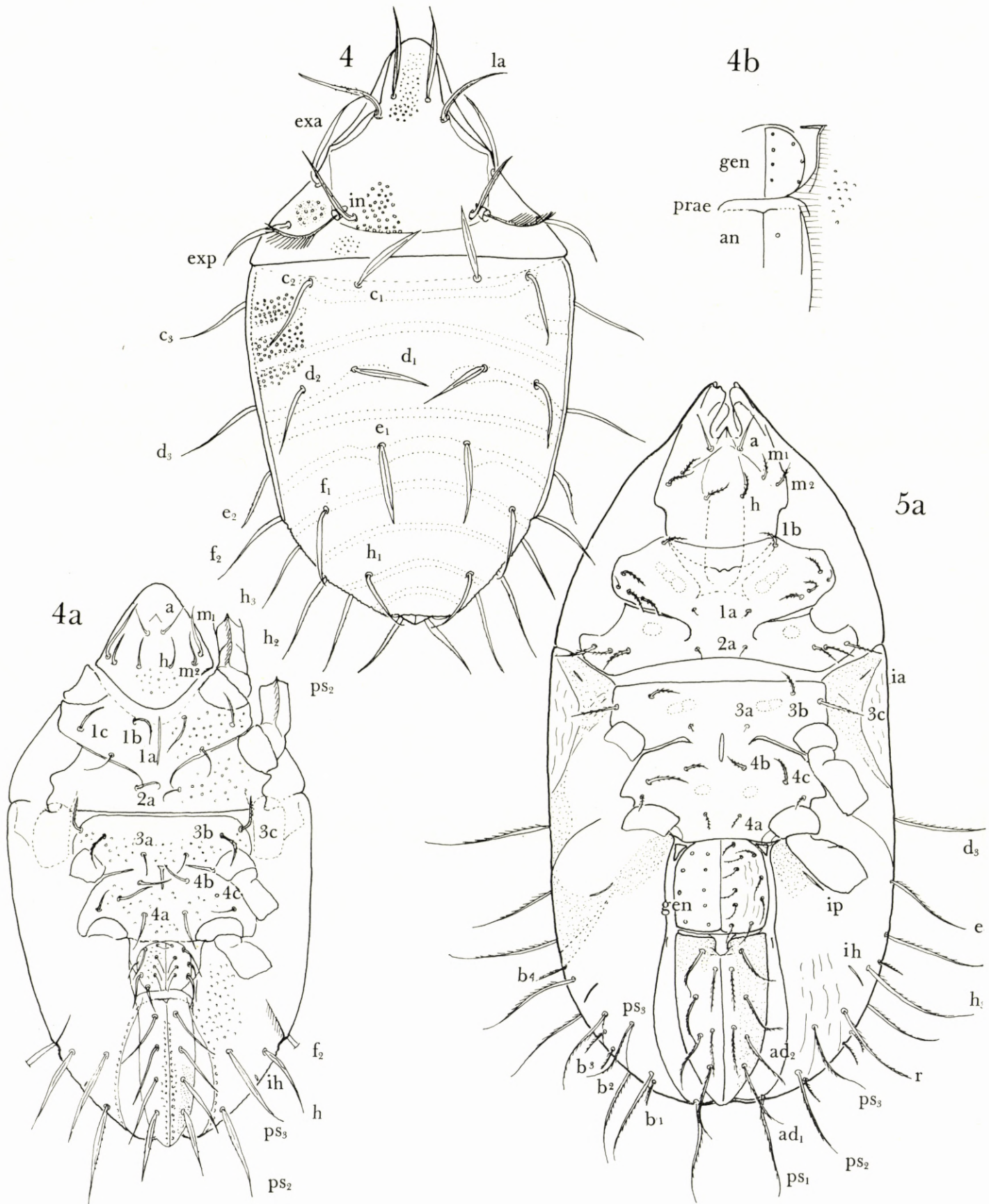
- Fig. 19. — , *Neotrichocephus tongaensis* n. subgen., n. sp.
 — 19a. — — — ventral view.
 — 20. ?*Pseudotocephus radiatus* n. sp.
 — 20a. — — notogastral hair.
 — 20b. — — ventral view.
 — 21. *Nesopelops caudatus* n. gen., n. sp.
 — 21a. — — interlamellar hair and surroundings.
 — 21b. — — ventral view.
 — 21c. — — Leg I.
 — 21d. — — Leg II.
 — 22. *samoensis* n. sp.
 — 22a. — — hair h2.
 — 22b. *tongalapuensis* n. sp.
 — 23a. — — ventral view.
 — 24. *Eremaeozetes octomaculatus* n. sp.
 — 24a. — — notogastral hair.
 — 24b. — — ventral view.
 — 25. *Allozetes translamellatus* n. sp.
 — 25a. — — ventral view.
 — 26. — *dispar* n. sp.
 — 26a. — — ventral view.
 — 27. *Anellozetes discifer* n. sp.
 — 28. *Humerobates fungorum* (L.), propodosoma and part of the hysterosoma.
 — 29. *Urobates pygiseta* n. gen., n. sp.
 — 29a. — — ventral view.
 — 30. *Subphauloppia luminosa* n. sp.
 — 30a. — — ventral view.
 — 31. — *glaber* n. sp.
 — 31a. — — ventral view.
 — 32. *Phauloppia caudata* n. sp.
 — 33. *Exoribatula Marginata* n. sp.
 — 33a. — — ventral view.
 — 34. *Cryptoribatula euaensis* n. sp.
 — 34a. — — ventral view.
 — 34b. — — lateral view.
 — 35. *Euaella Gilteae* n. gen., n. sp.
 — 35a. — — ventral view.
 — 36. *Planobates circumalatus* n. gen., n. sp.
 — 36a. — — lateral view.
 — 36b. — — ventral view.
 — 36c. — — Leg I.
 — 37. *Ingella bicolor* n. sp.
 — 37a. — — ventral view.
 — 38. *Brassiella penicillifer* n. sp.
 — 38a. — — ventral view.
 — 39. *Scheloribates latoincisus* n. sp.
 — 39a. — — pseudostigmatic organ.
 — 39b. — — ventral view.
 — 40. — *biarcualis* n. sp.
 — 40a. — — ventral view.

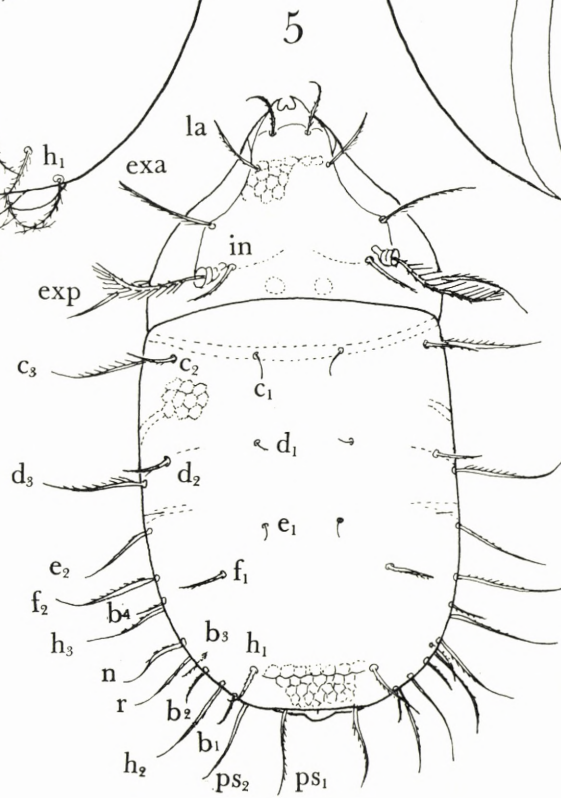
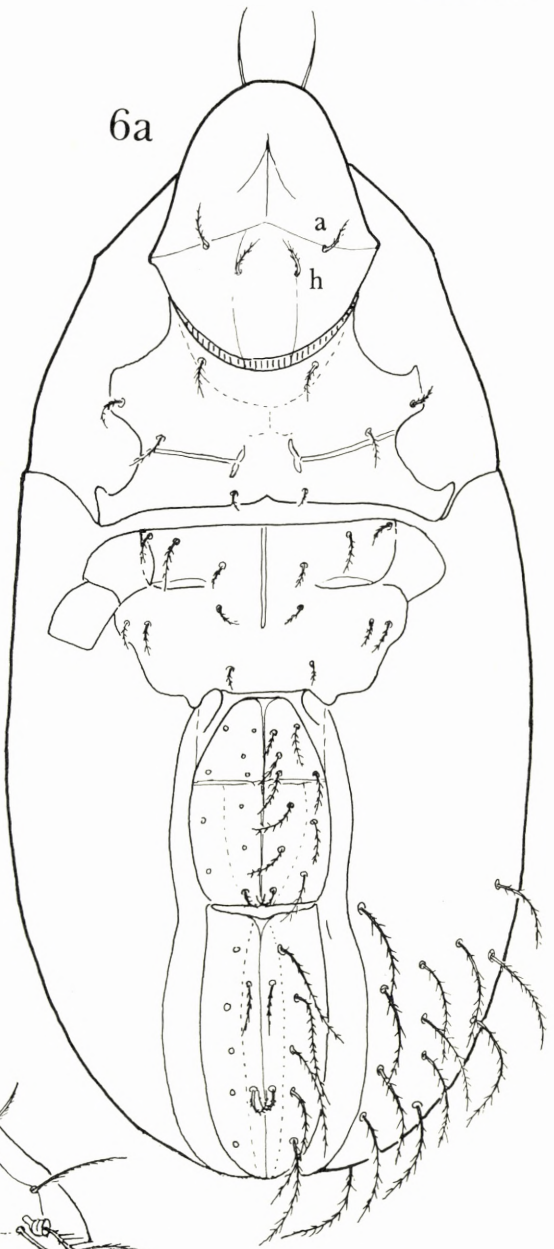
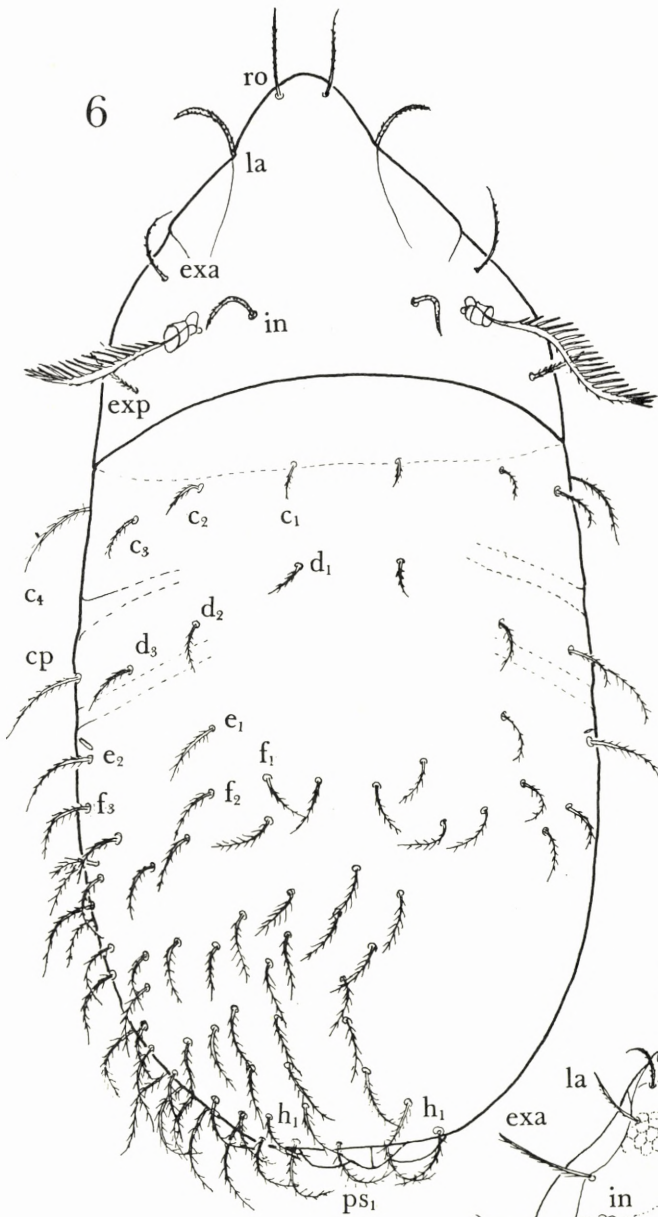
- Fig. 41. — *sphaeroides* n. sp.
 — 41a. — — pseudostigmatic organ.
 — 41b. — — ventral view.
 — 42. *Samoabates acutirostrum* n. gen., n. sp.
 — 42a. — — propodosoma in an oblique lateral view.
 — 42b. — — ventral view.
 — 42c. — — Leg I.
 — 43. *Striatobates tuberculatus* n. gen., n. sp.
 — 43a. — — propodosoma in an oblique lateral view.
 — 43b. — — ventral view.
 — 43c. — — Leg I.
 — 44. *Perscheloribates clavatus* n. gen., n. sp.
 — 44a. — — propodosoma in an oblique lateral view.
 — 44b. — — ventral view.
 — 45. *Neoscheloribates grandiporosus* n. gen., n. sp.
 — 45a. — — lateral view (with only a few details) showing the lamellar system.
 — 45b. — — ventral view.
 — 46. *Tuberemaeus indentatus* n. sp.
 — 46a. — — pseudostigmatic organ.
 — 46b. — — ventral view.
 — 46c. — *perforatus* (Willm.) pseudostigmatic organ.
 — 46d. — *thienemanni* (Willm.) pseudostigmatic organ.
 — 47. *Xylobates mollicoma* n. sp.
 — 47a. — — pseudostigmatic organ.
 — 47b. — — r1 with hair pore.
 — 47c. — — ventral view.
 — 48a. — *seminudus* Hammer pseudostigmatic organ.
 — 48b. — — genital plate.
 — 48c. — — Leg I.
 — 48d. — — Leg III.
 — 48e. — — palp.
 — 49. *Polyxylobates diversiporosus* n. gen., n. sp.
 — 49a. — — propodosoma in an oblique lateral view.
 — 49b. — — pseudostigmatic organ.
 — 49c. — — left Aa.
 — 49d. — — ventral view.
 — 49e. — — genital plate.
 — 50. *Galumna euaensis* n. sp.
 — 50a. — — propodosoma in lateral view.
 — 50b. — — ventral view.
 — 51. — *planiclava* n. sp.
 — 51a. — — propodosoma in lateral view.
 — 51b. — — pseudostigmatic organ.
 — 51c. — — ventral view.
 — 52. *Pergalumna bryani* (Jacot).
 — 52a. — — propodosoma in lateral view.
 — 52b. — — pseudostigmatic organ.
 — 53. — *bimaculata* n. sp.
 — 53a. — — propodosoma in lateral view.

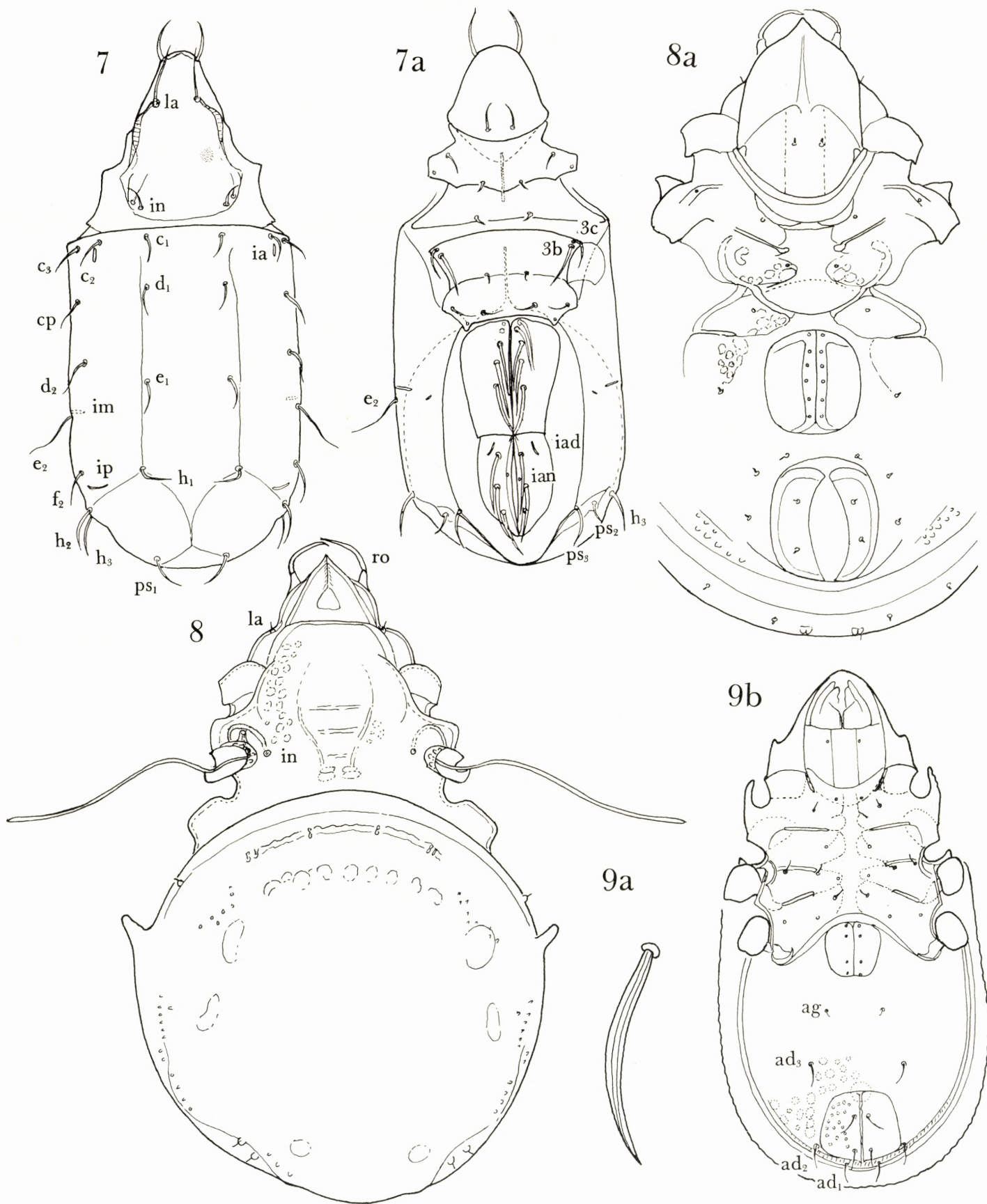
- Fig. 53b. - - ventral view.
- 54. - *foveolata* n. sp.
- 54a. - - ventral view.
- 55. *Neogalumna antenniger* n. gen., n. sp.
- 55a. - - propodosoma in lateral view.
- 55b. - - ventral view.
- 56. *Disparagalumna tongaensis* n. gen., n. sp.
- 56a. - - propodosoma in lateral view.
- 56b. - - pseudostigmatic organ.
- 56c. - - Aa with surroundings.
- 56d. - - ventral view.
- 57. *Allogalumna upoluensis* n. sp.
- 57a. - - pseudostigmatic organ.
- 57b. - - ventral view.
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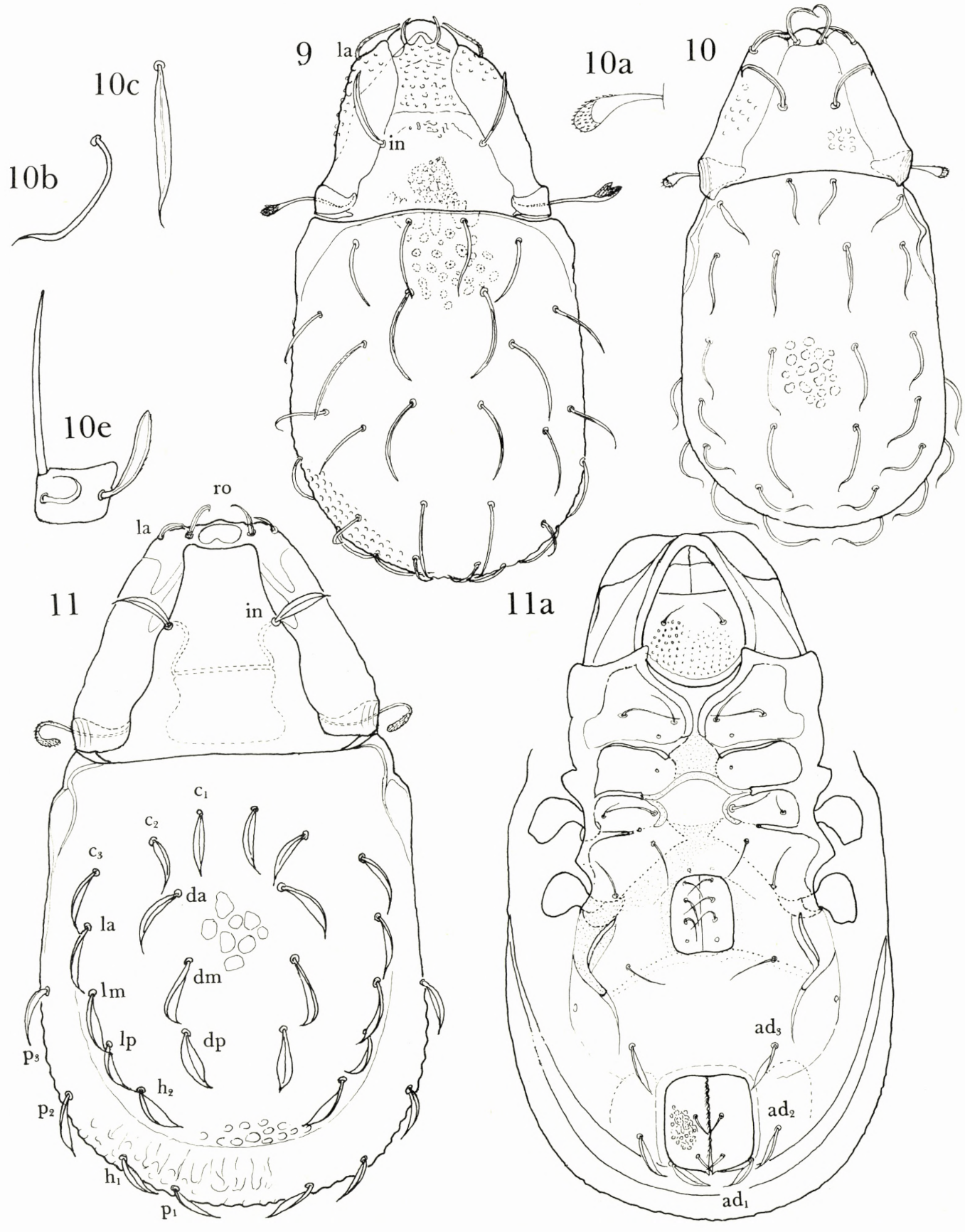
PLATES



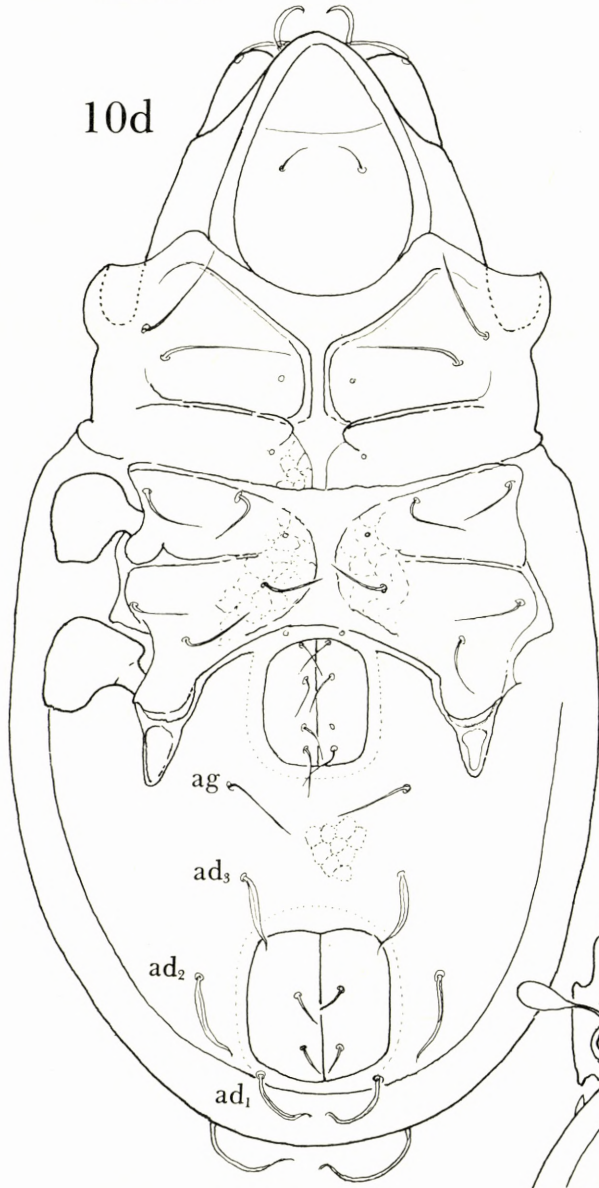




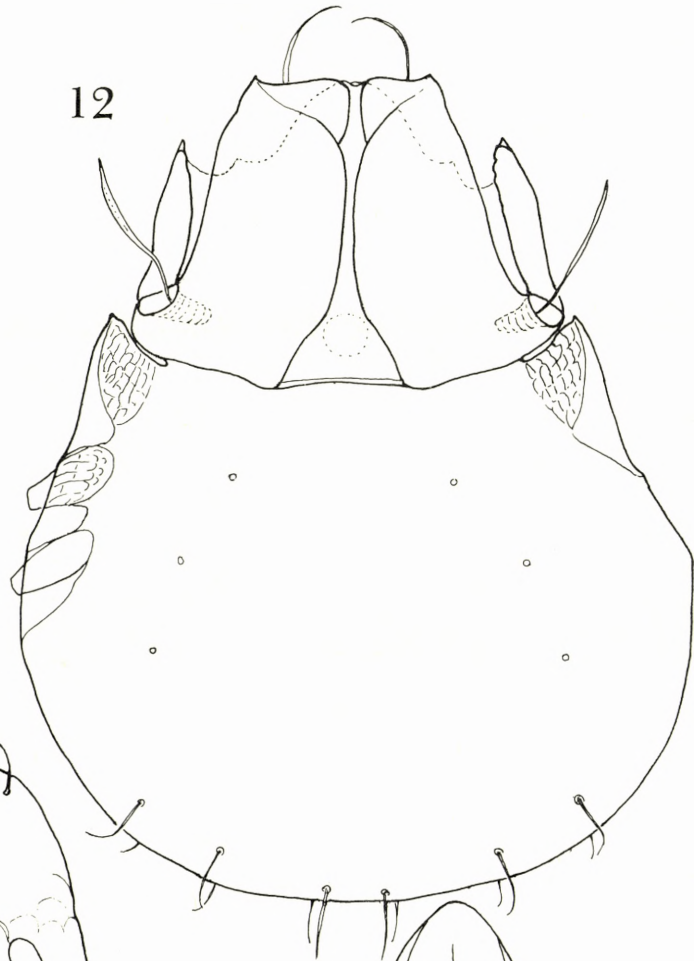




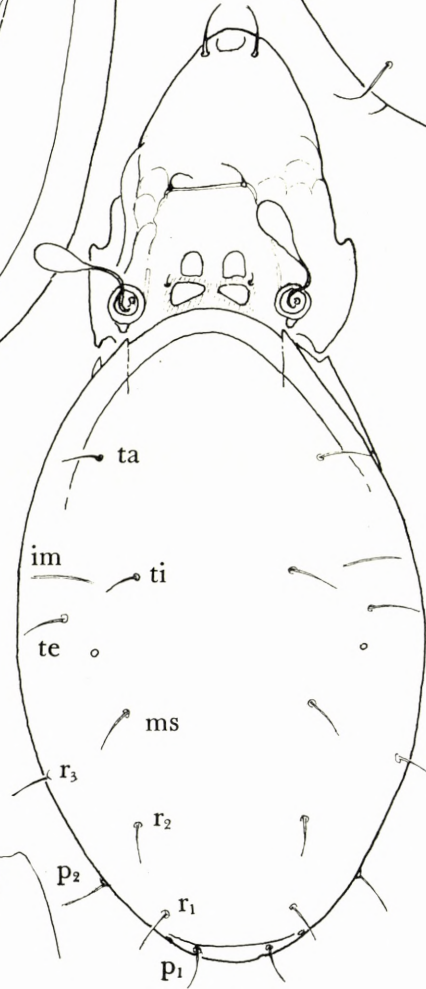
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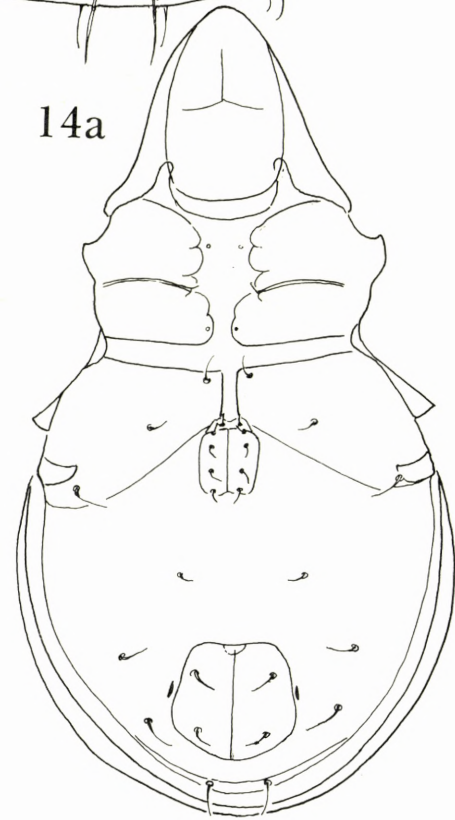
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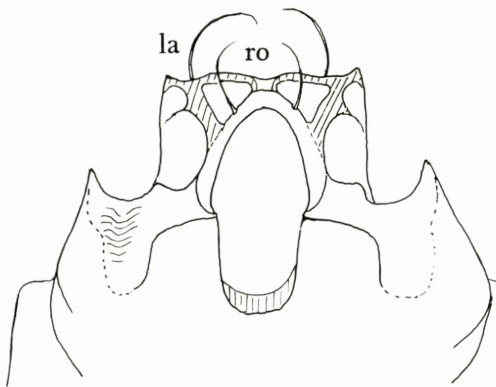
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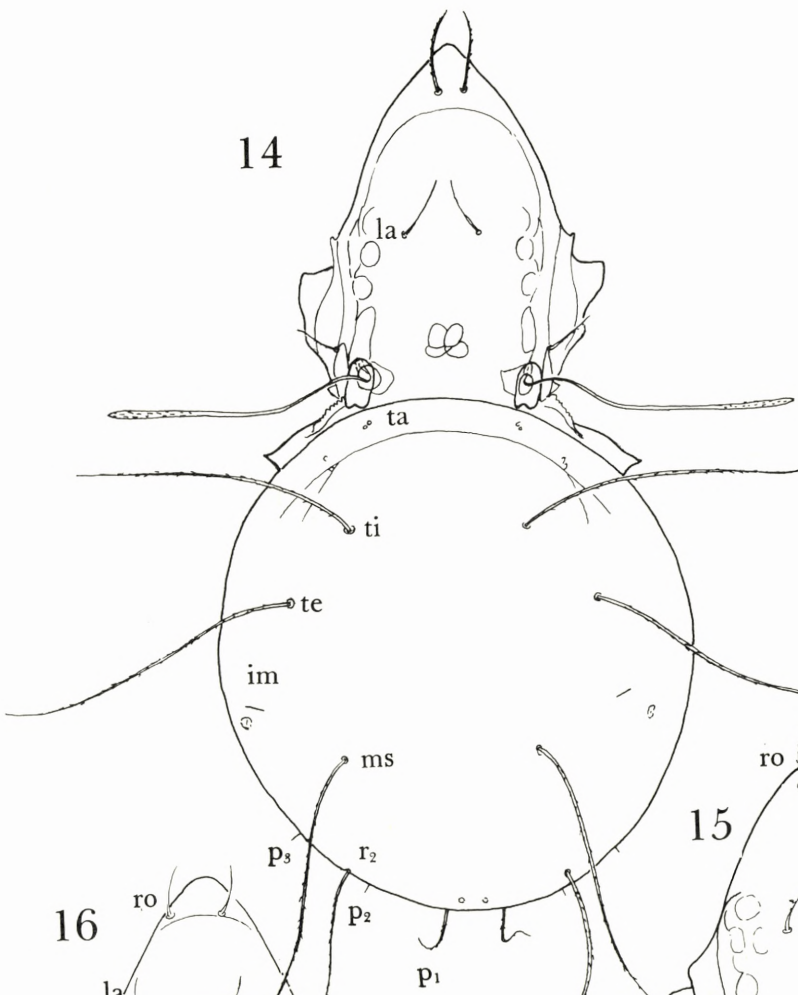
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12a



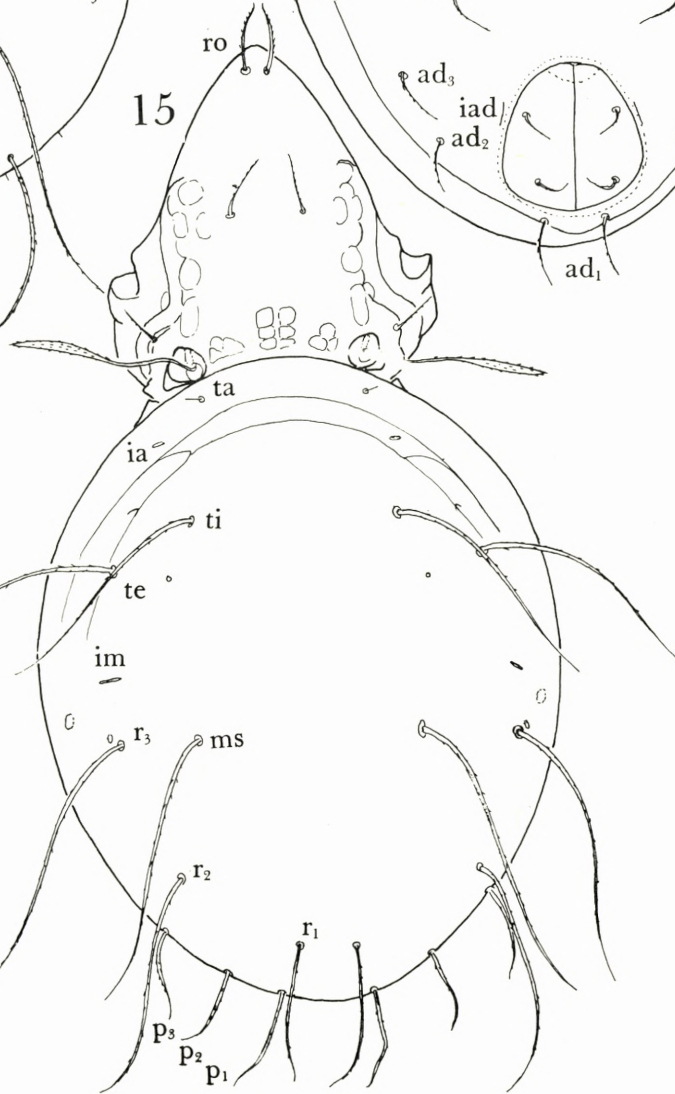
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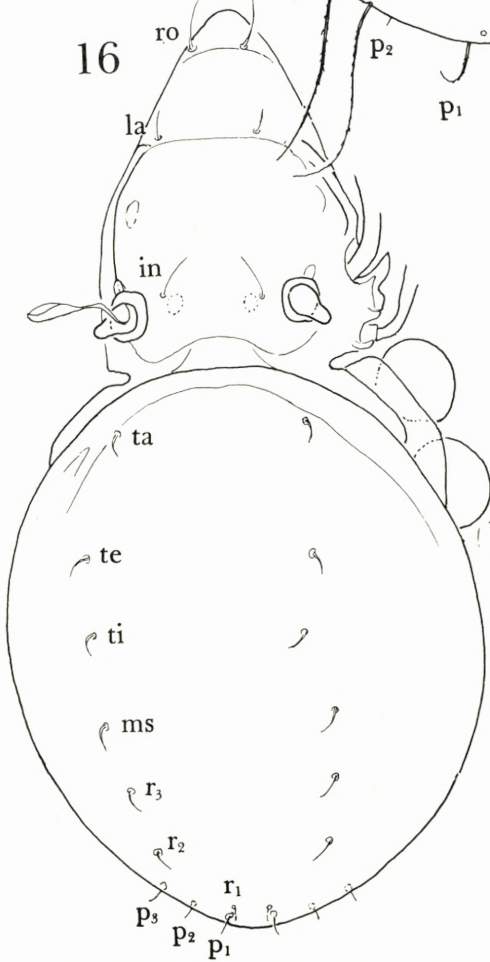
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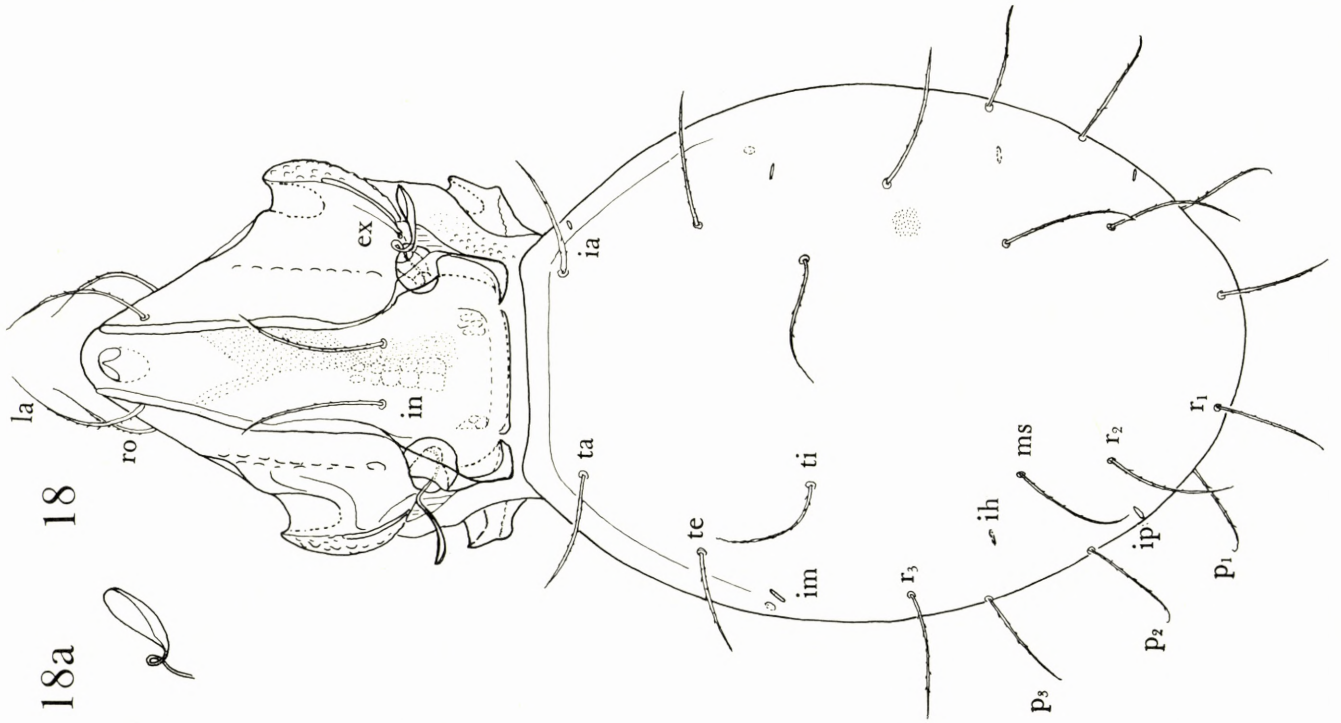


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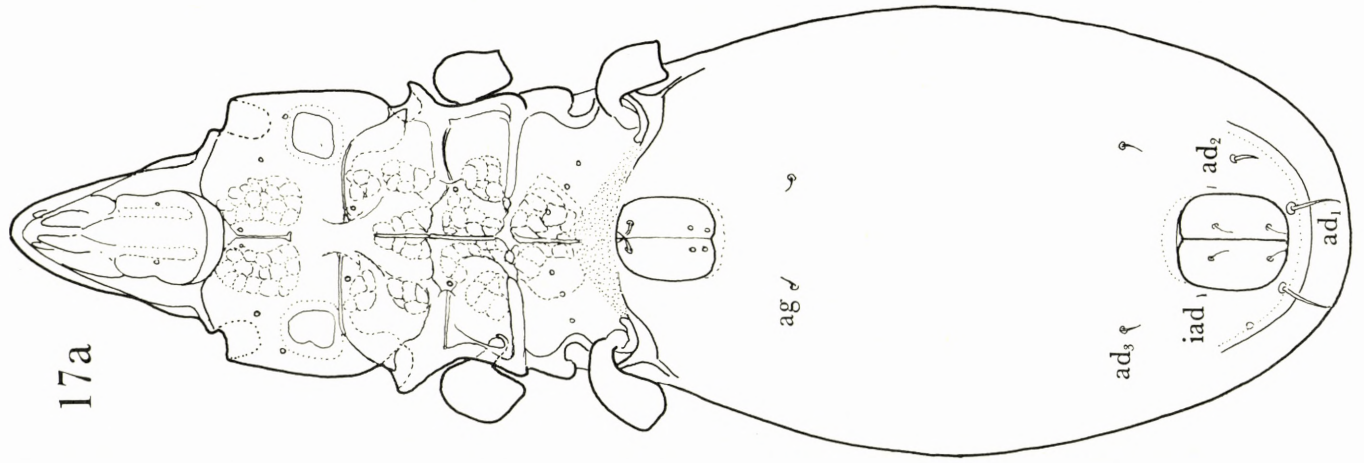


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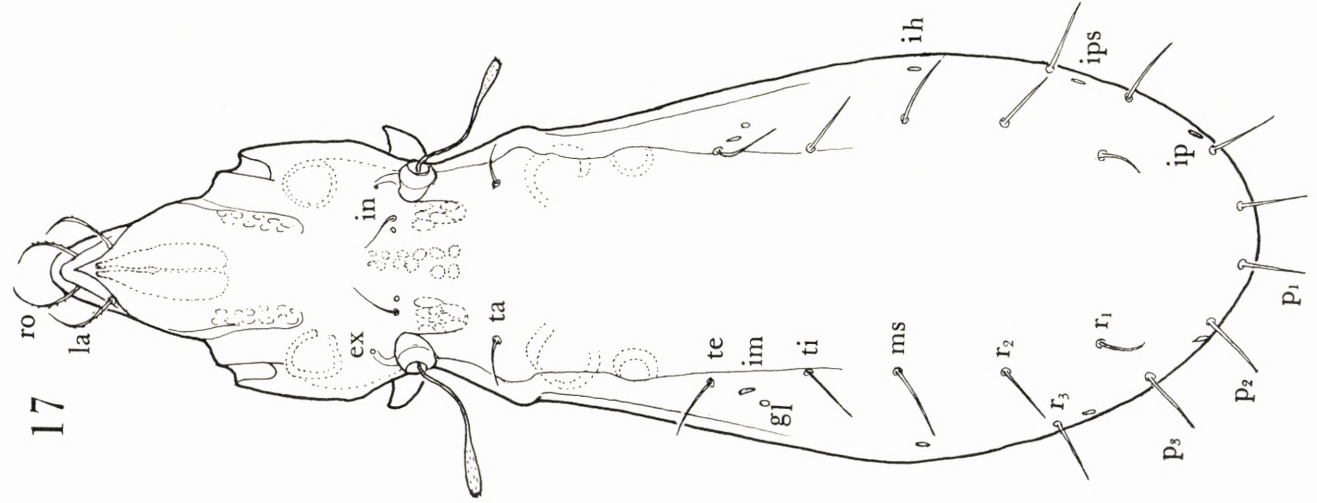




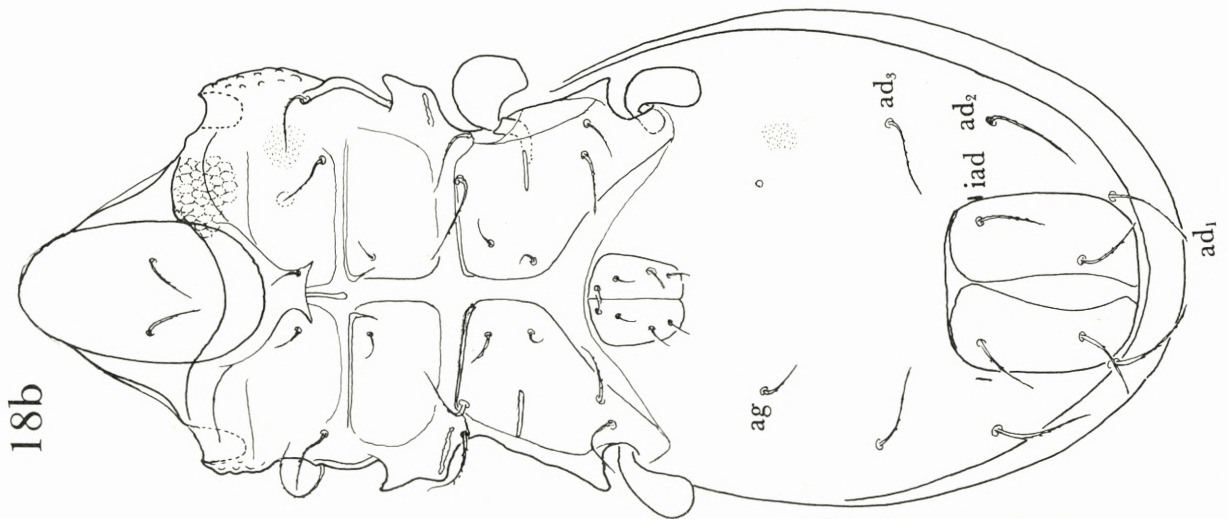
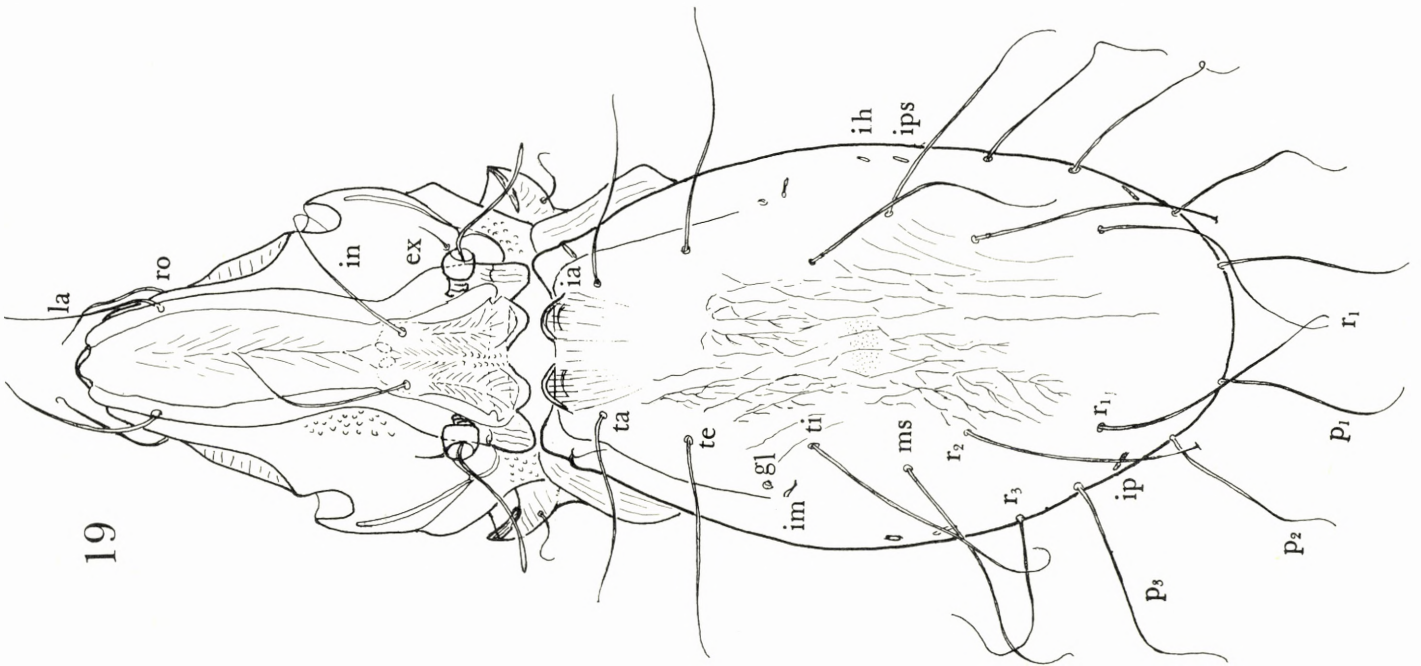
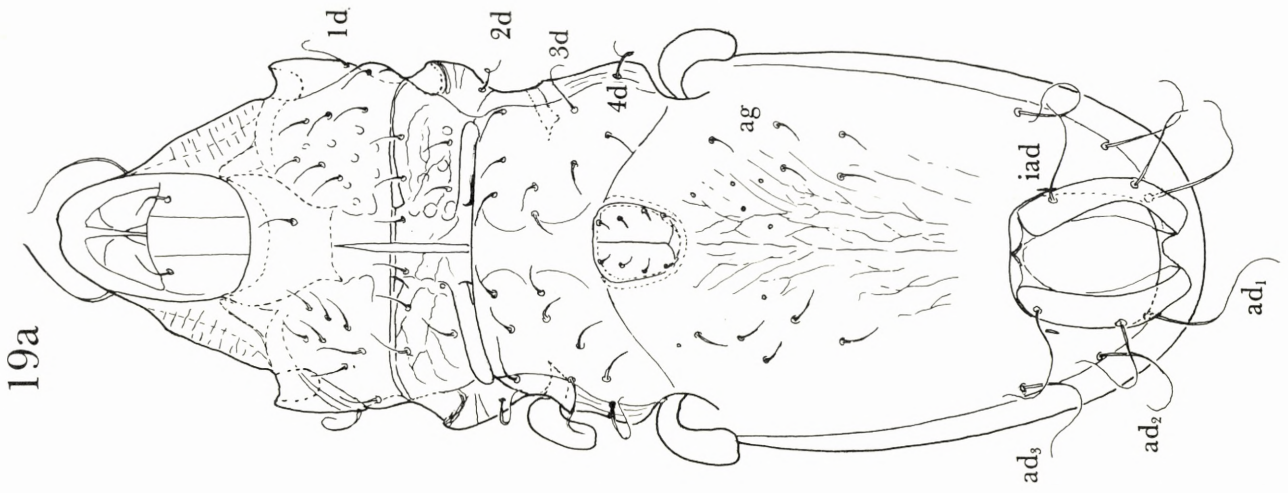
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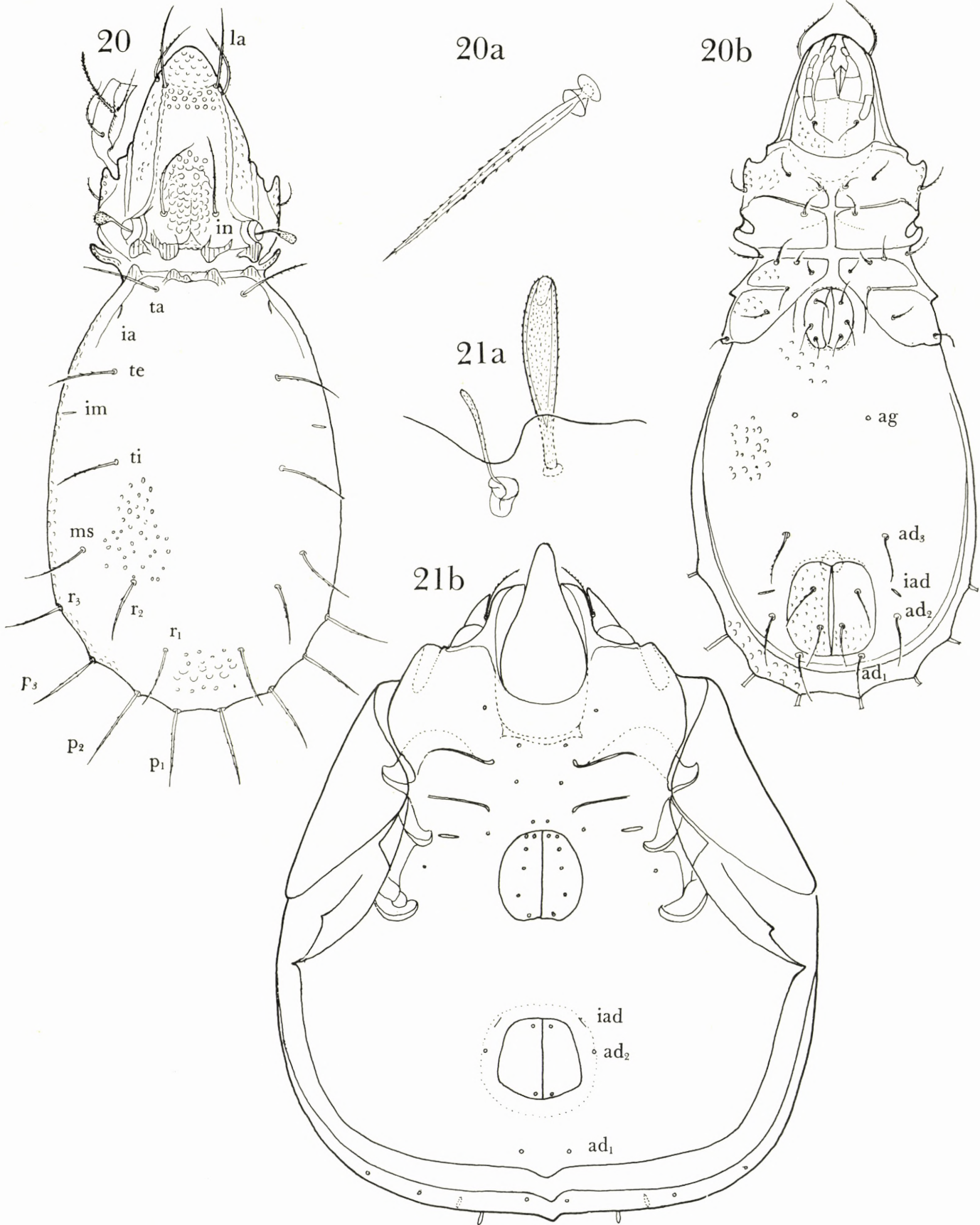


17a



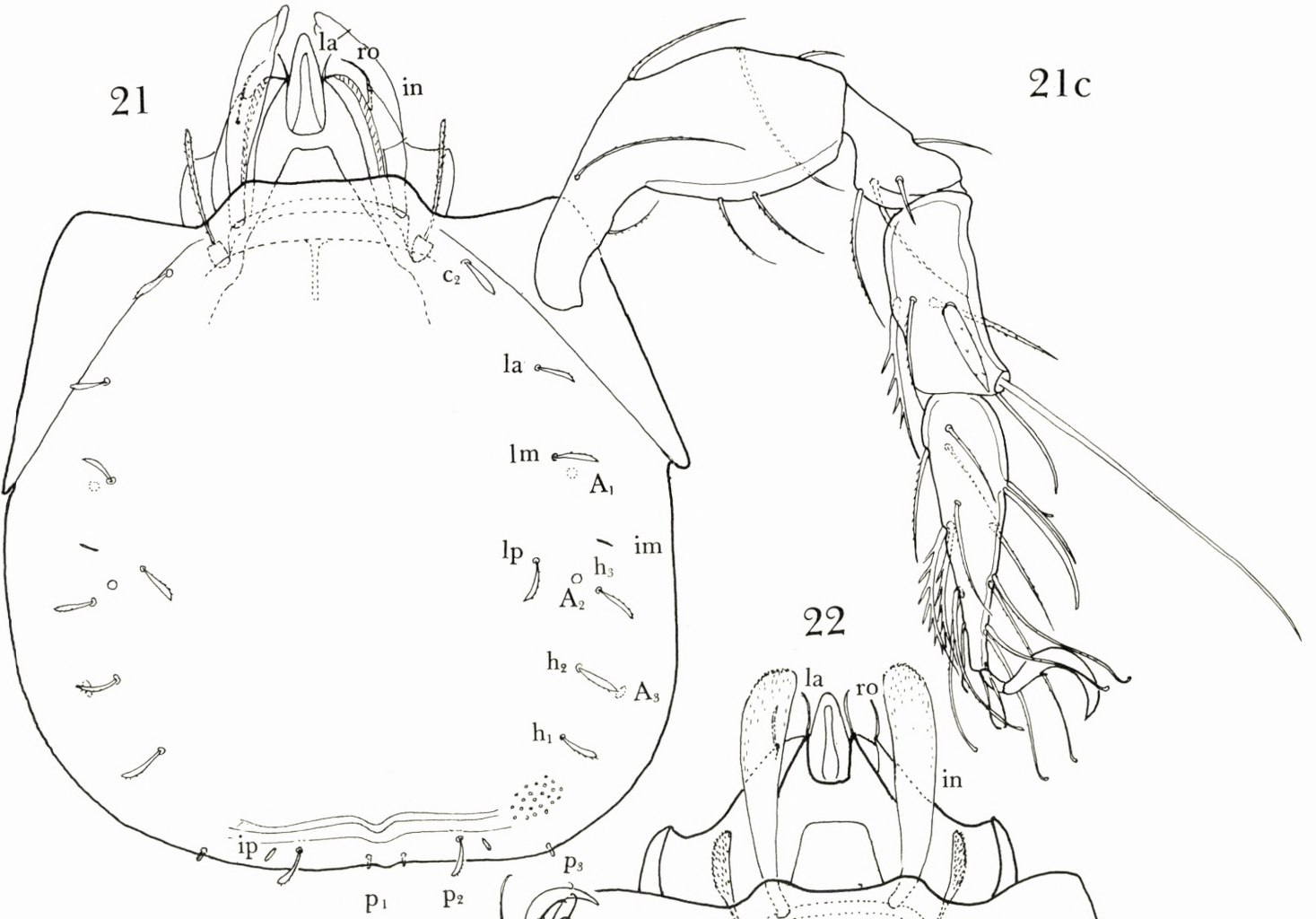
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21

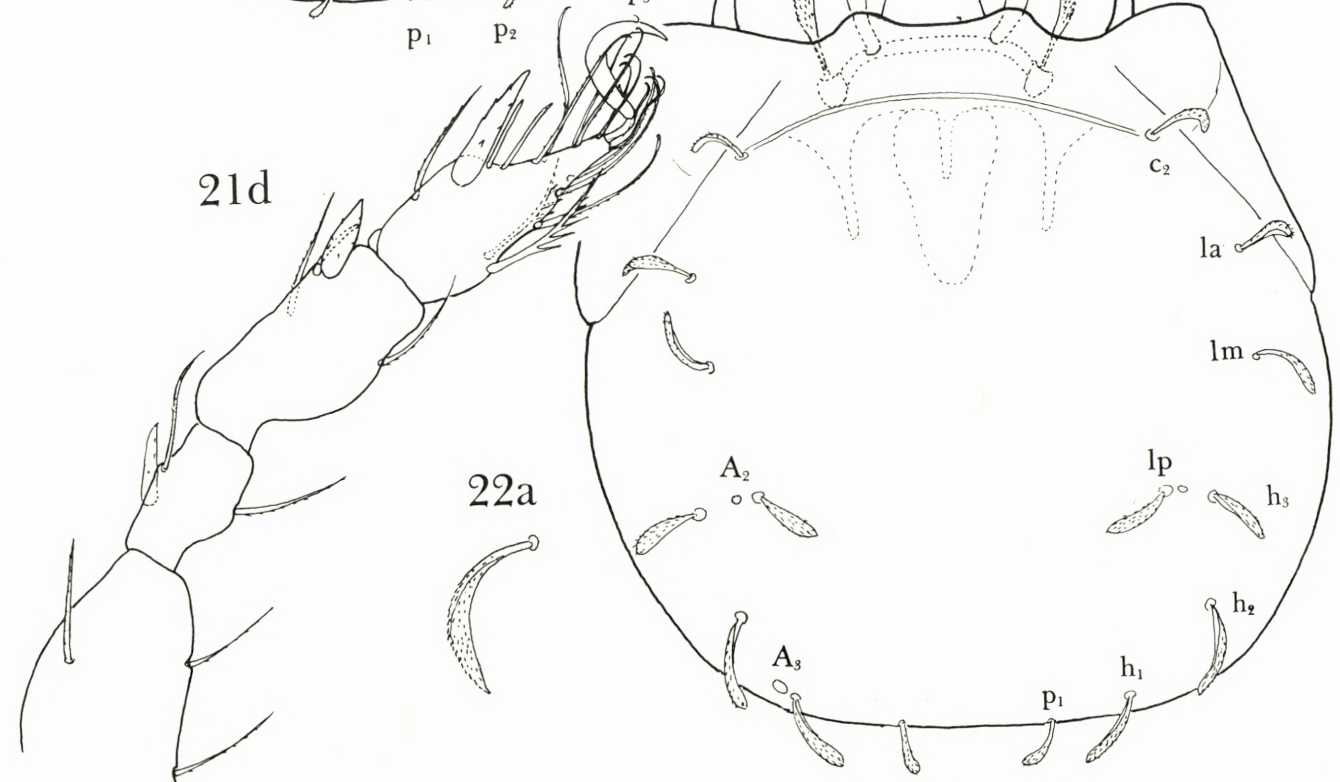
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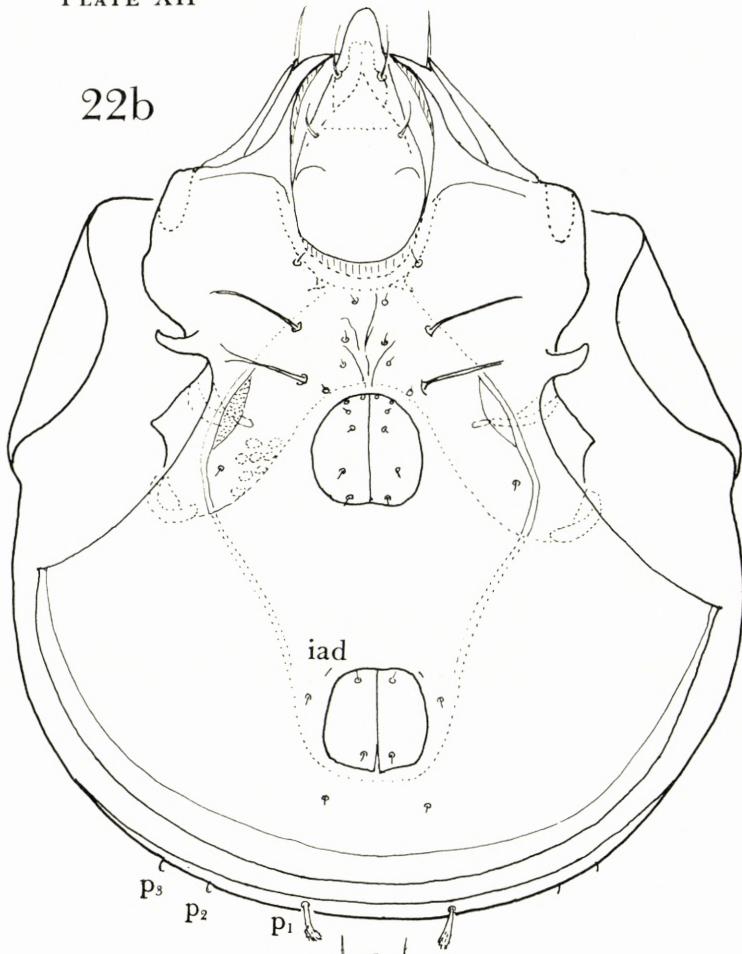
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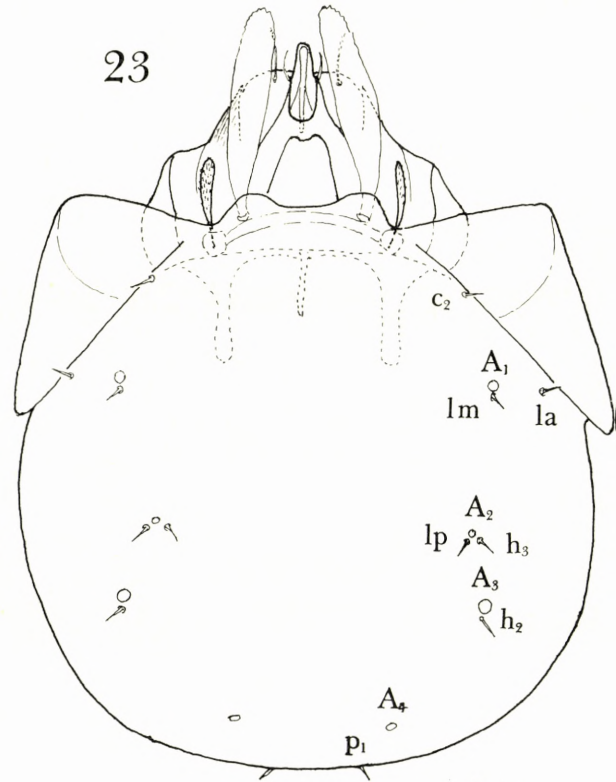
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22b

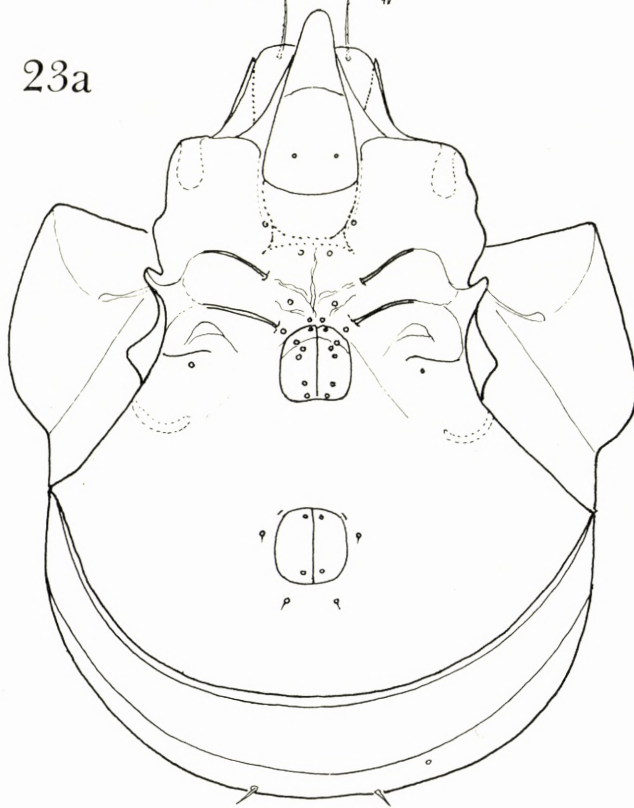


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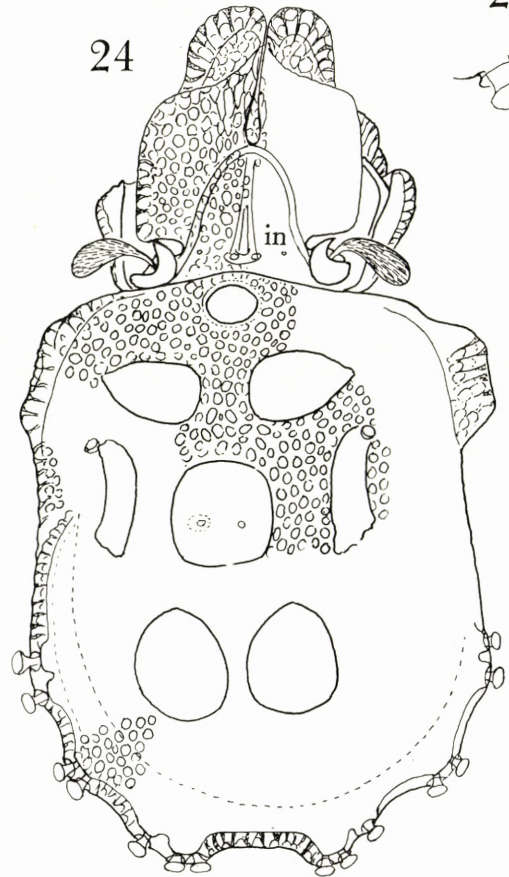


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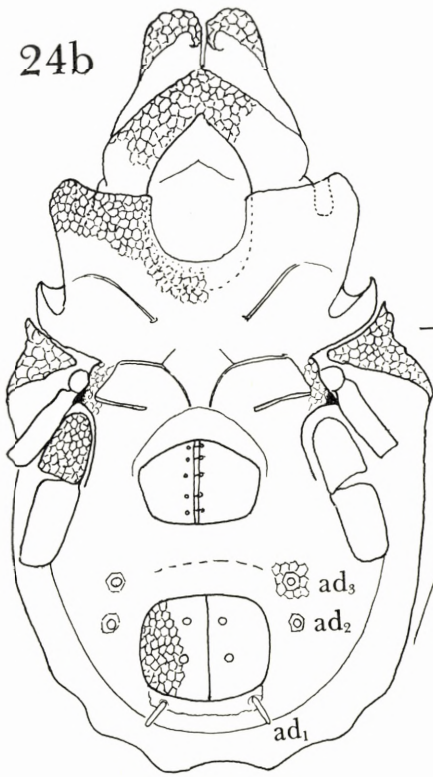
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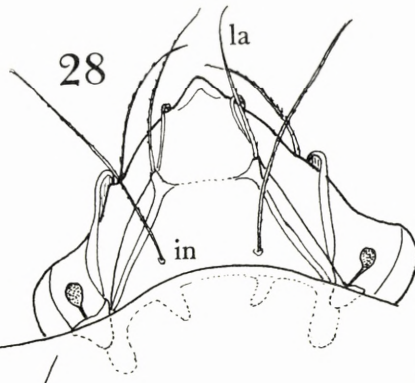
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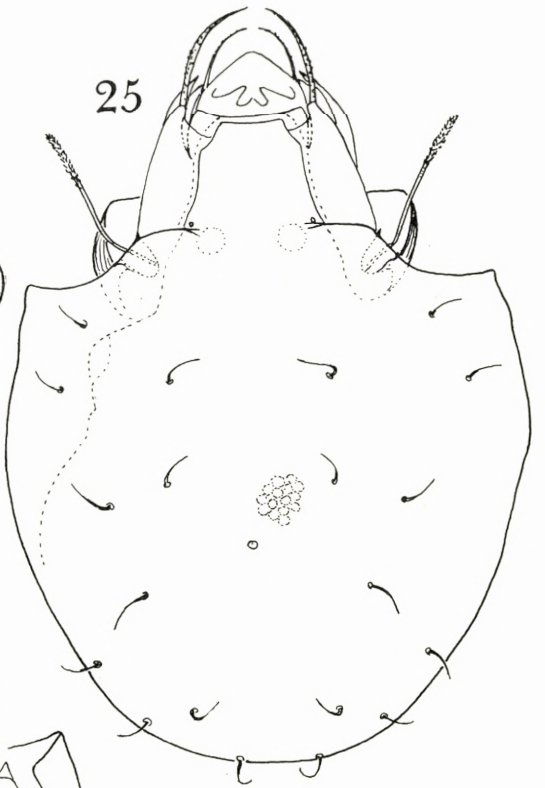
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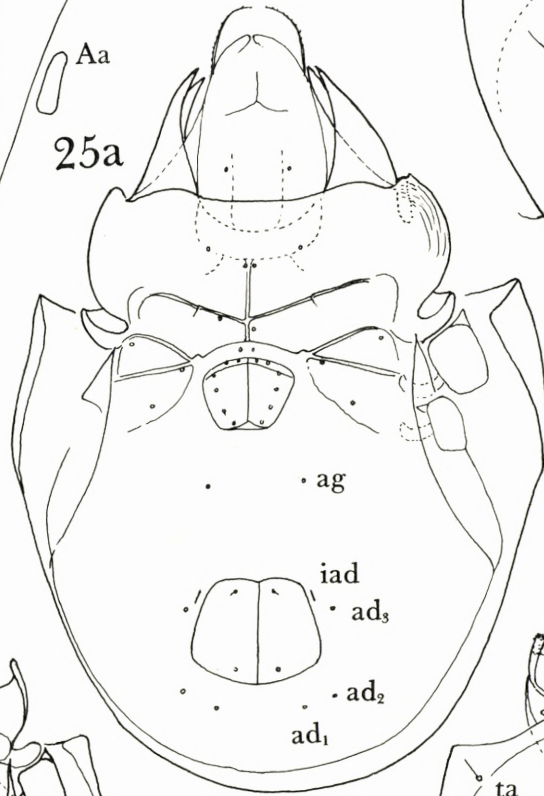
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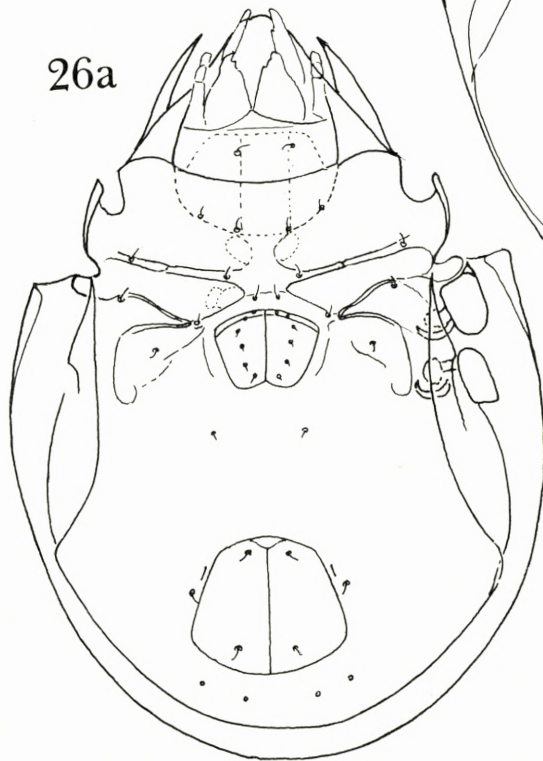
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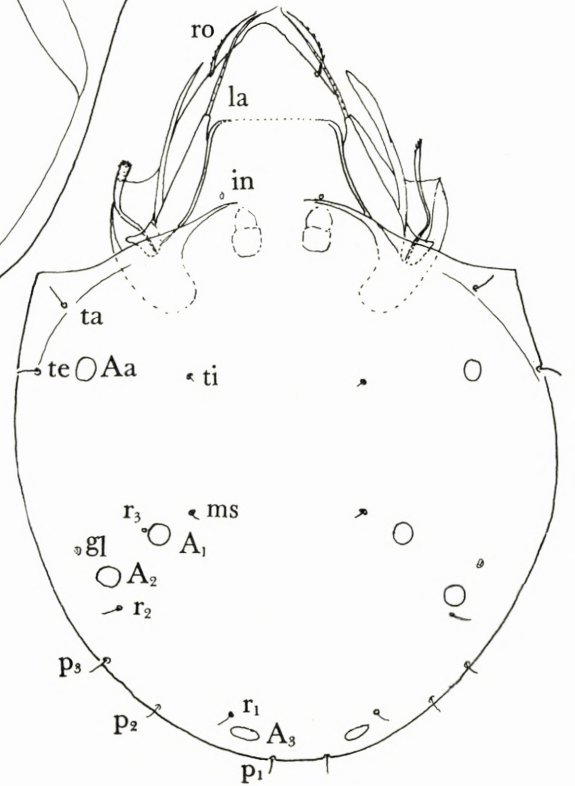
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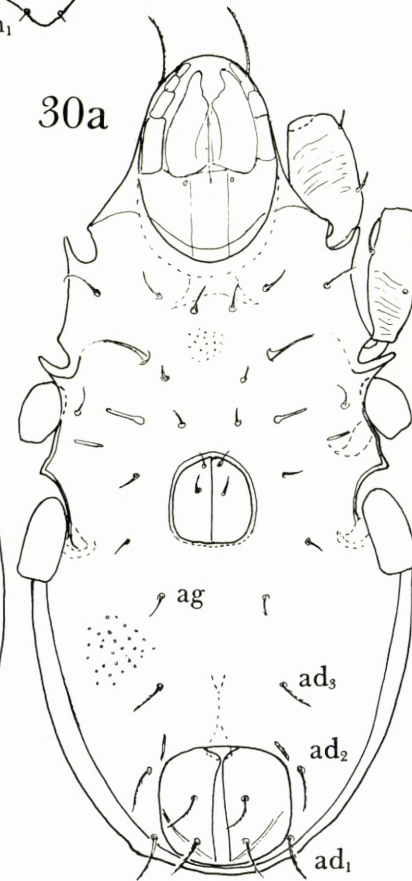
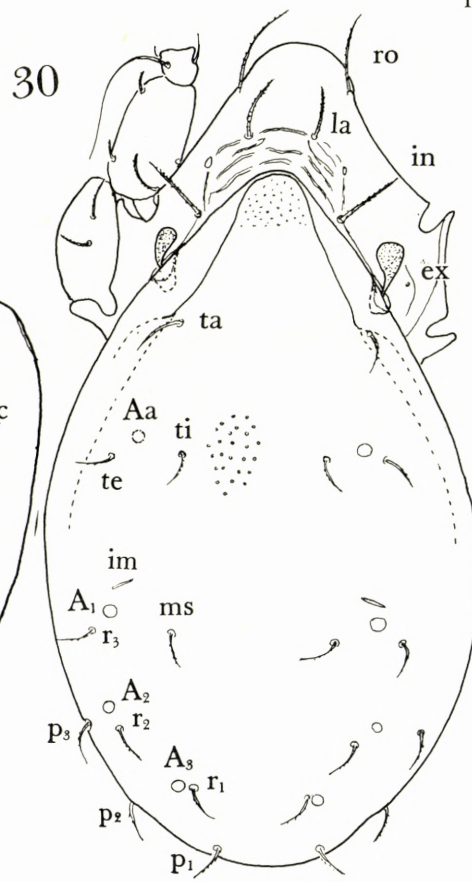
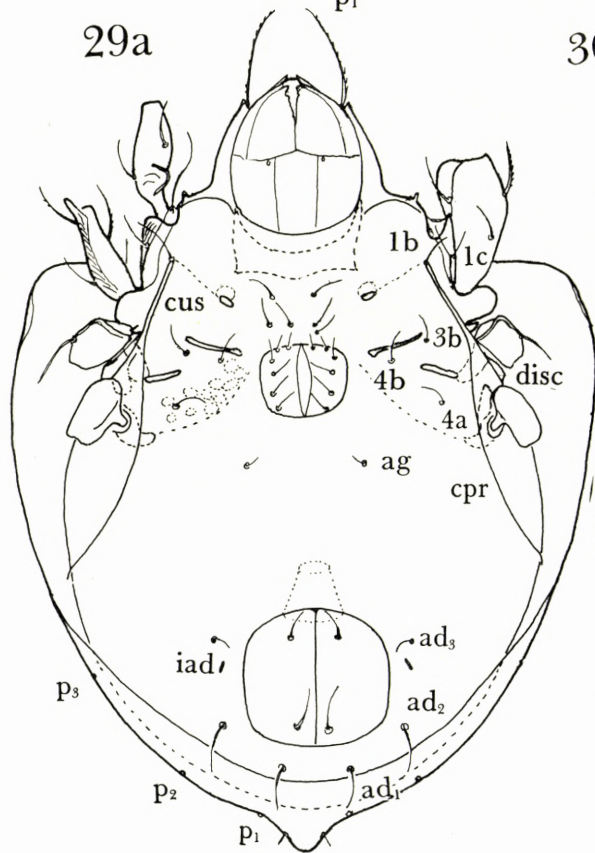
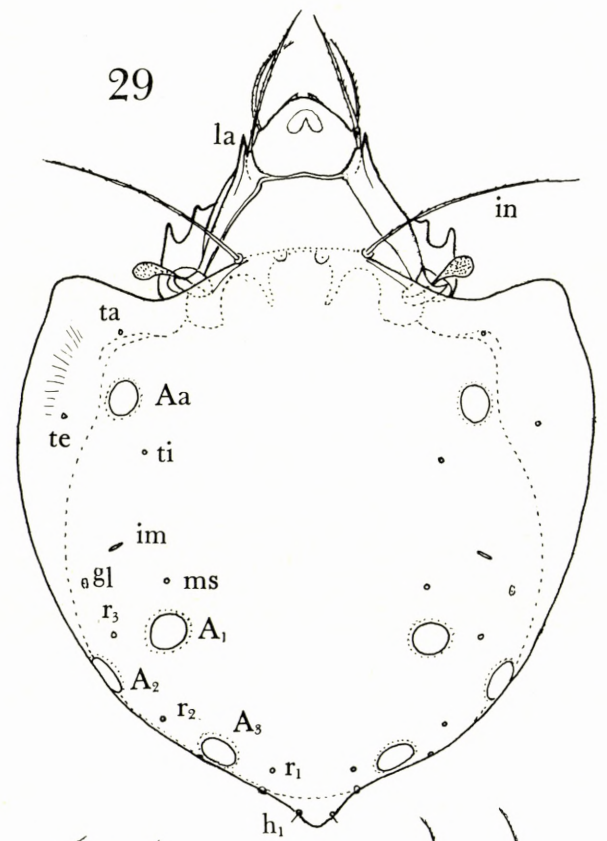
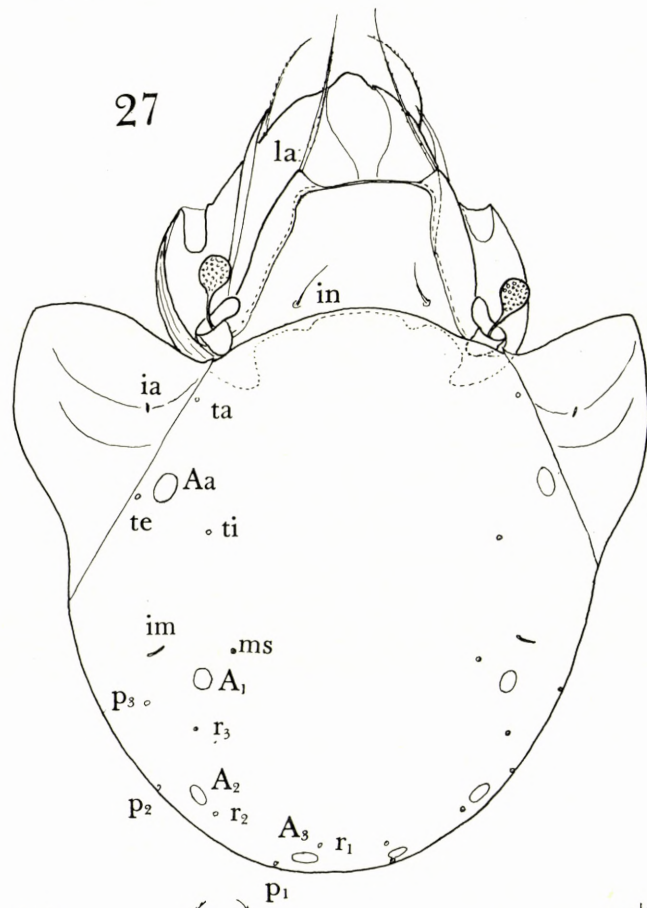


26a

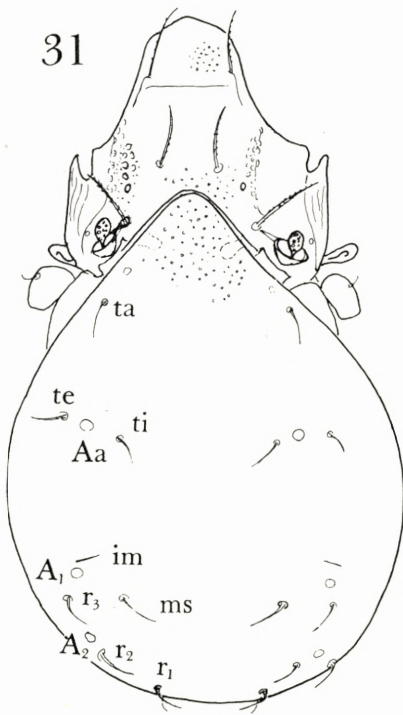


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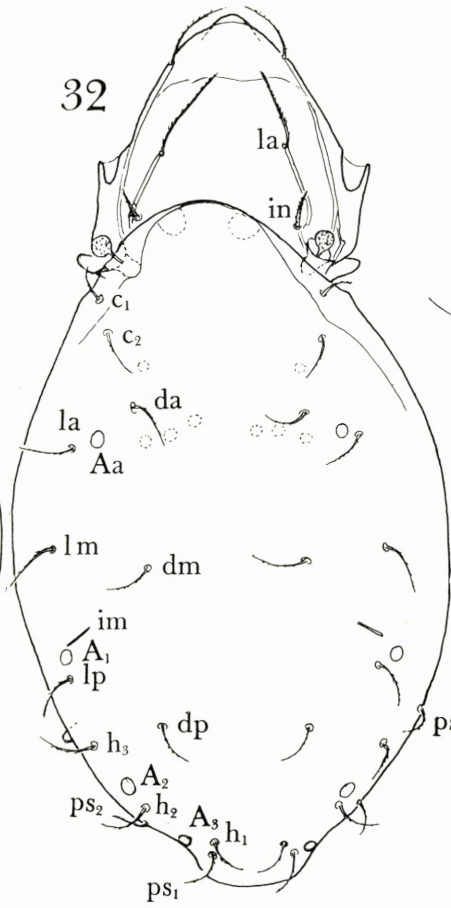




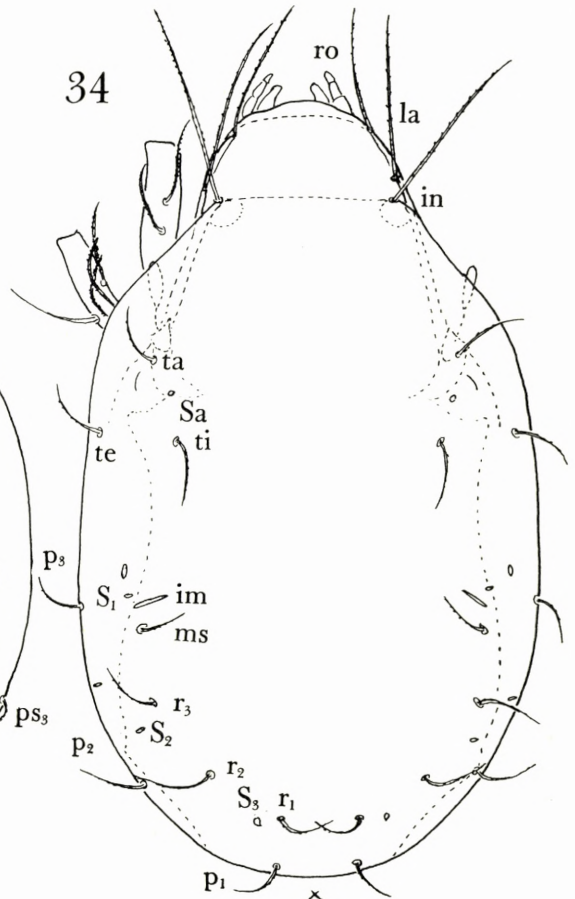
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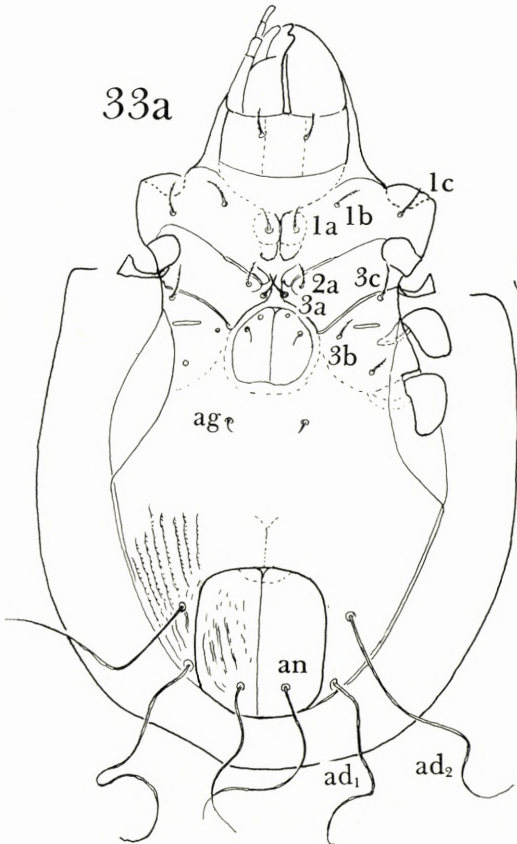
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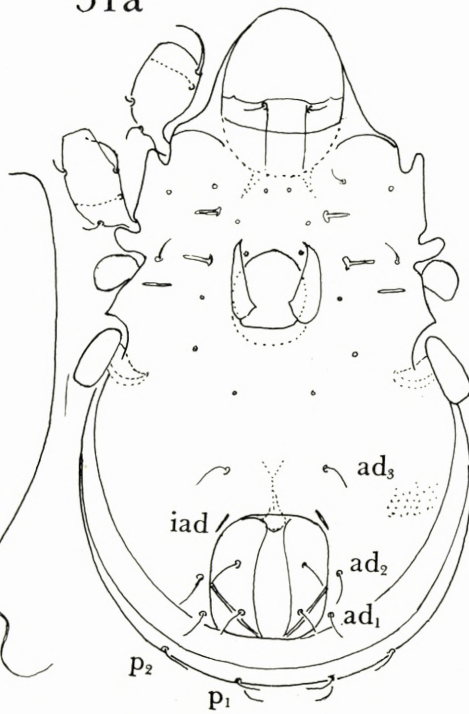
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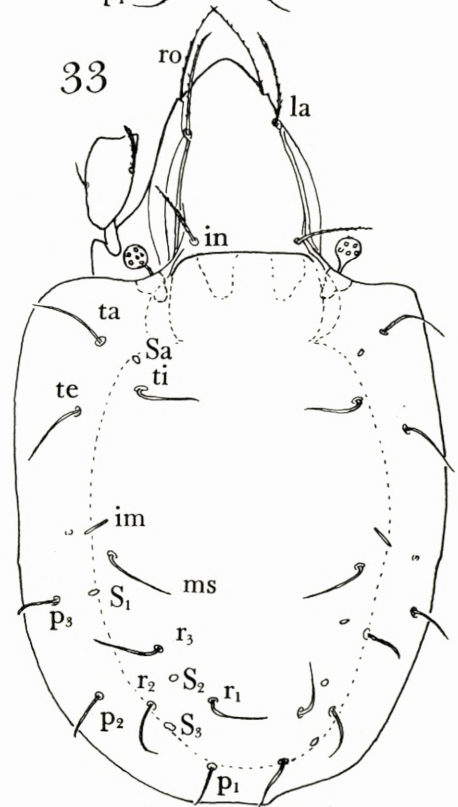
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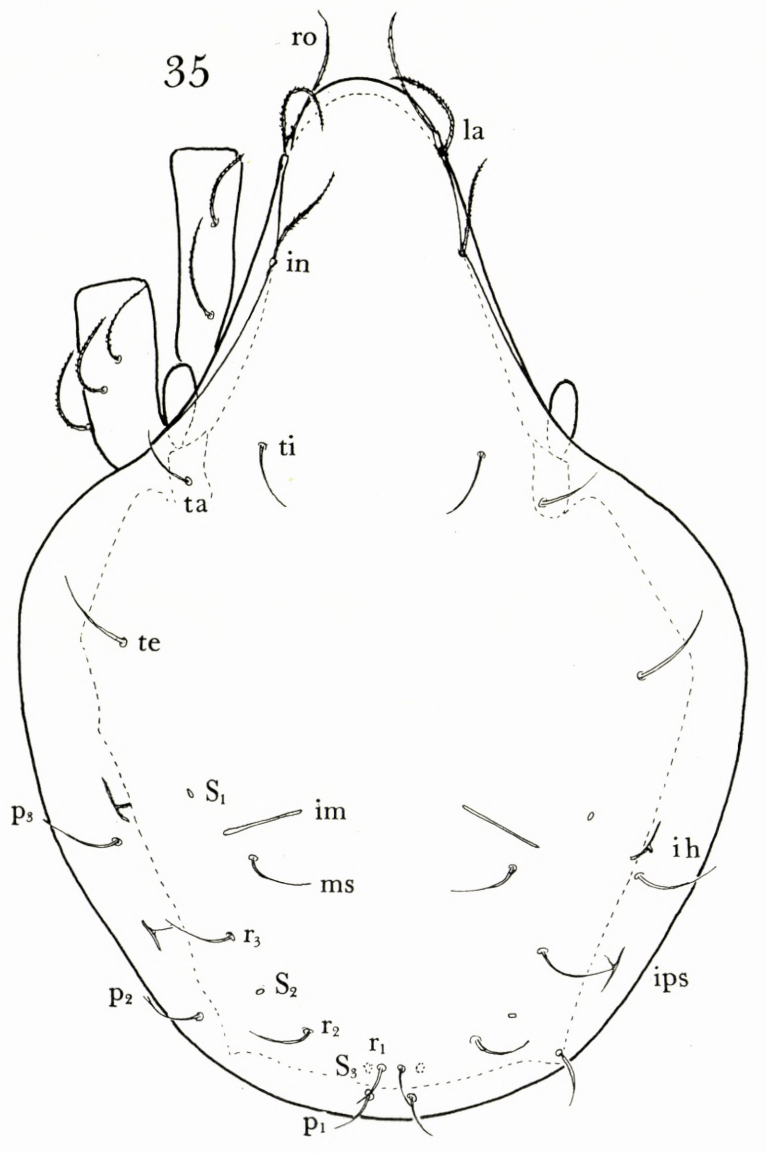
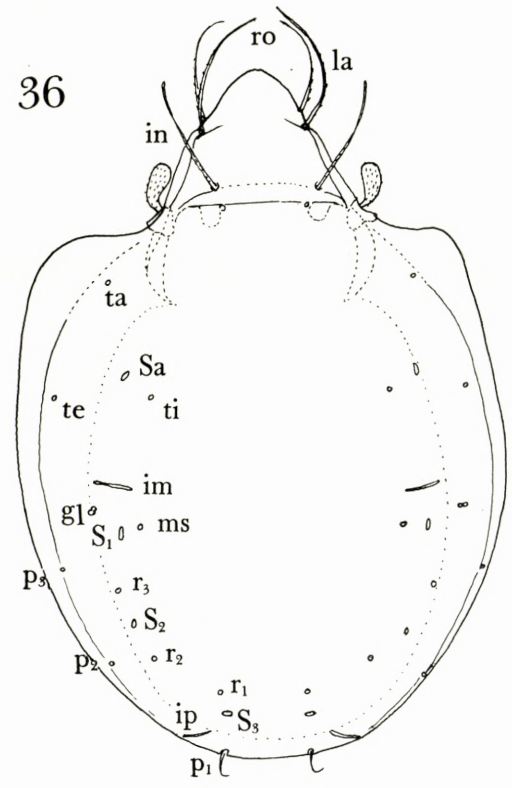
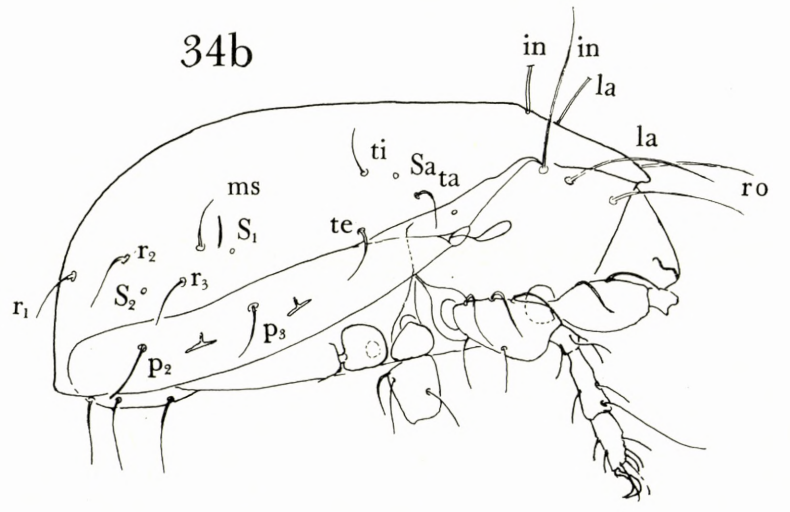
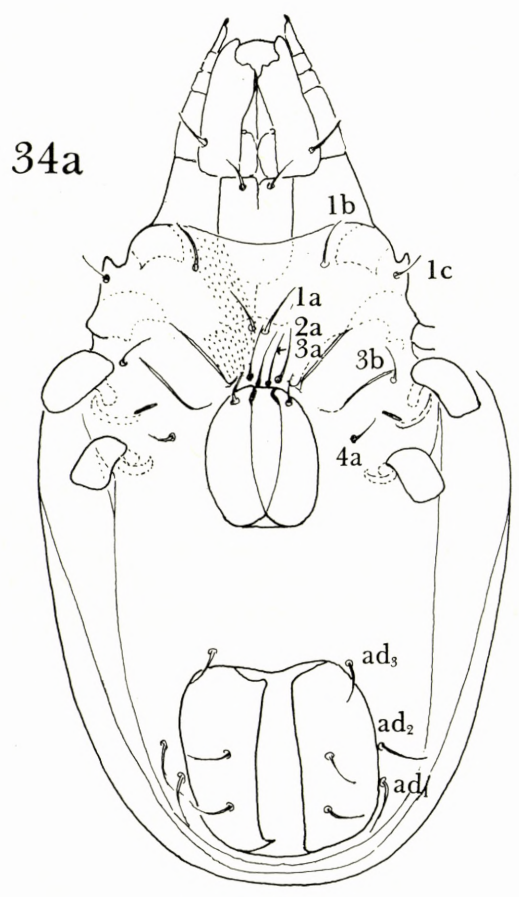


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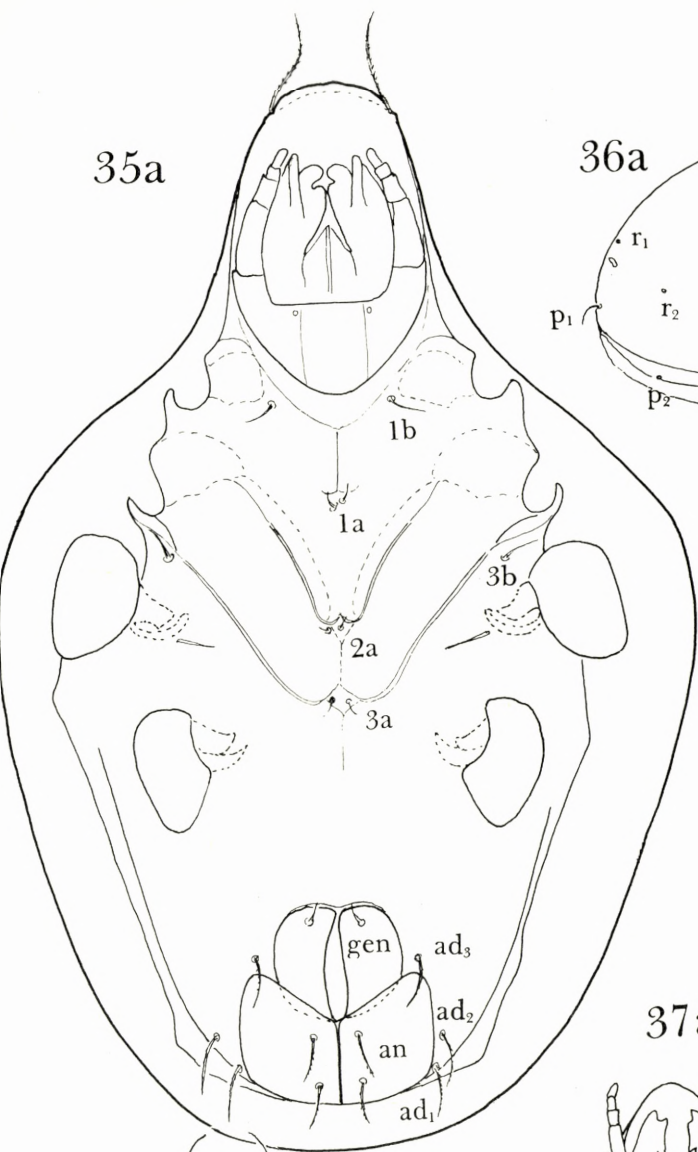


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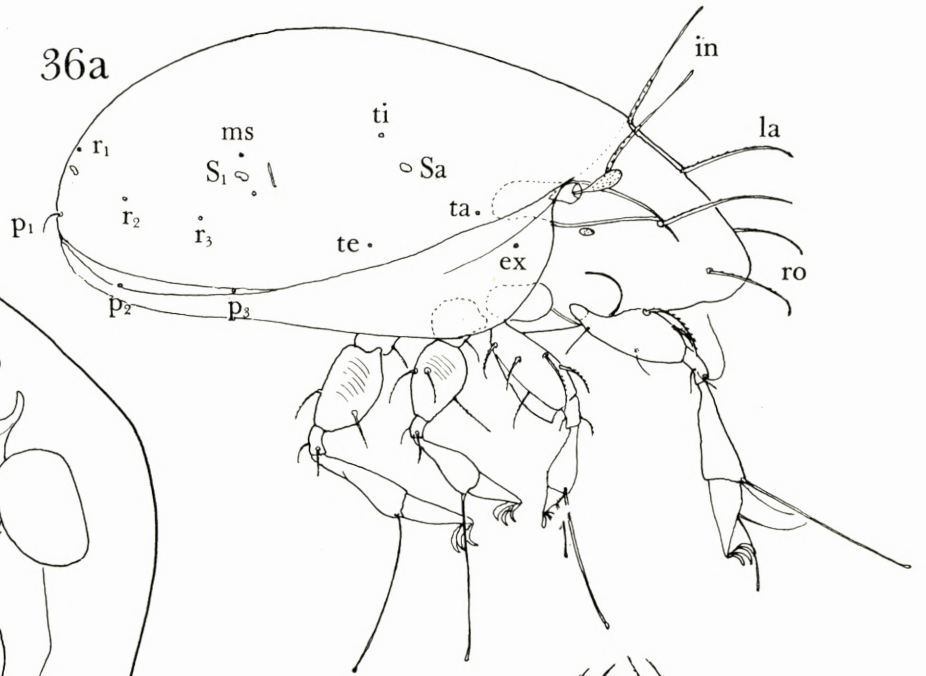




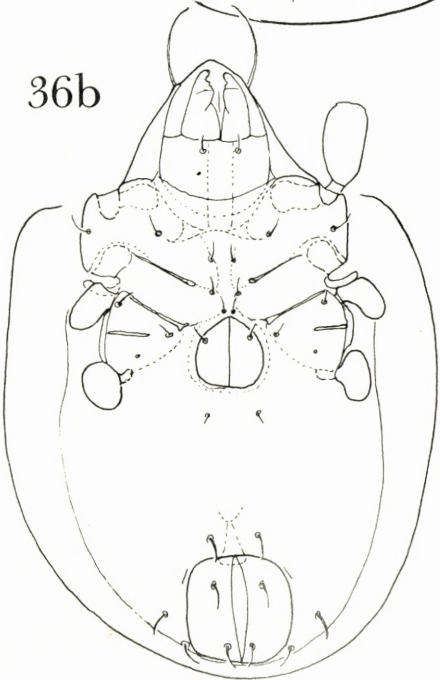
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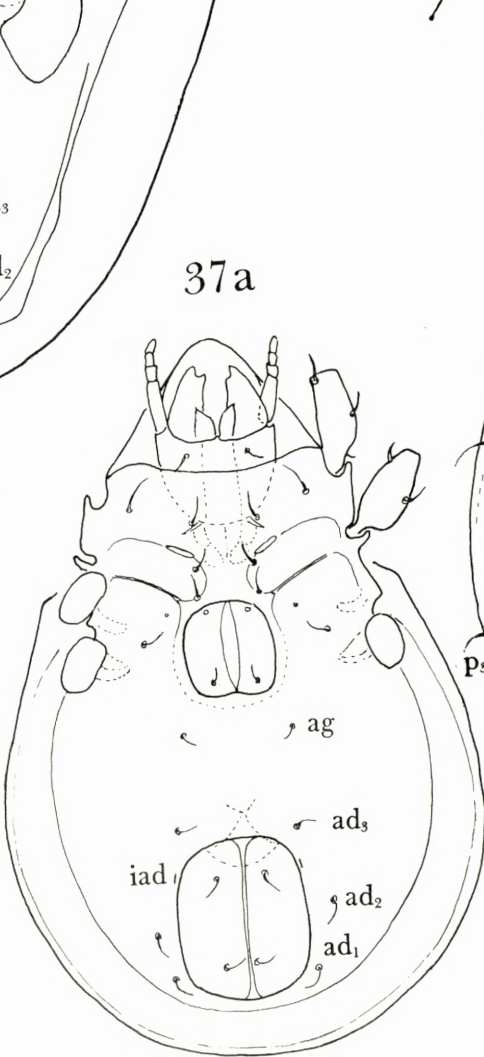
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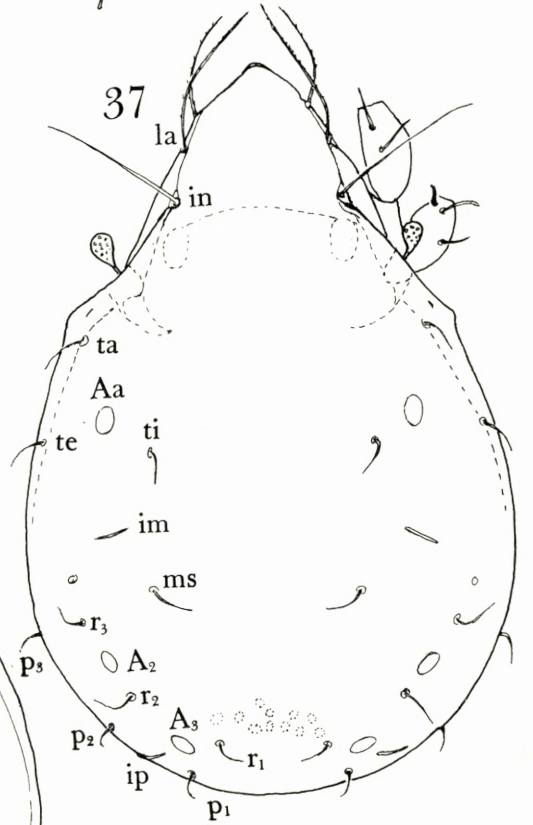
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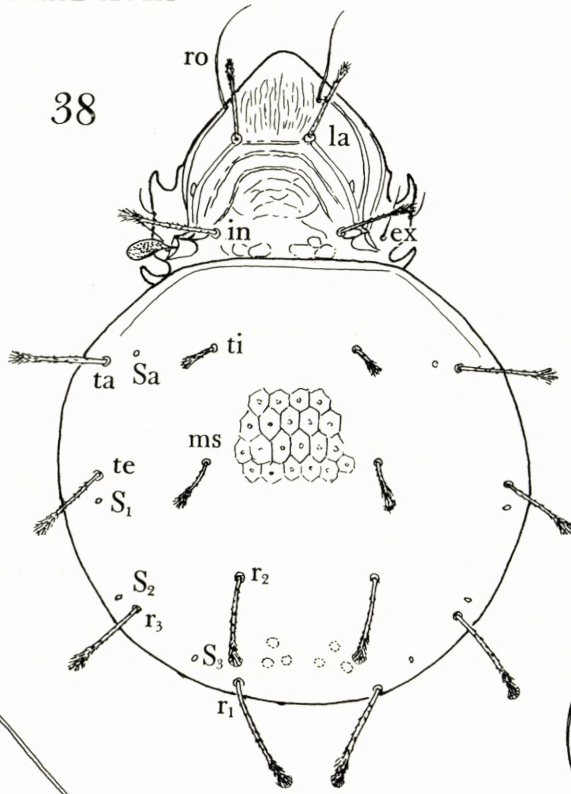
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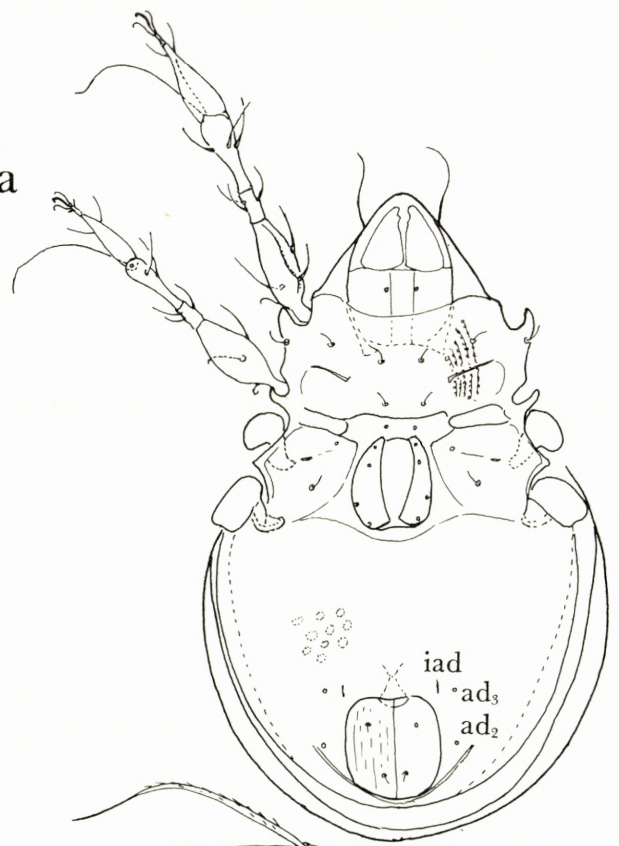
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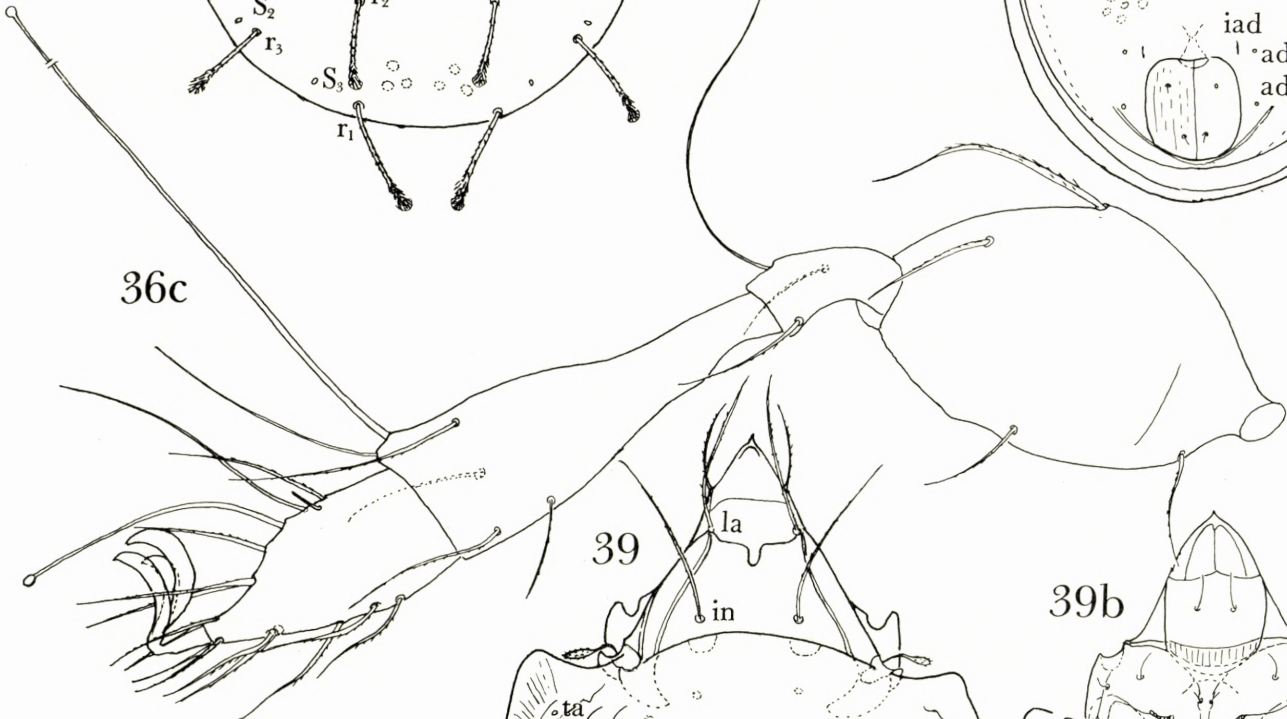
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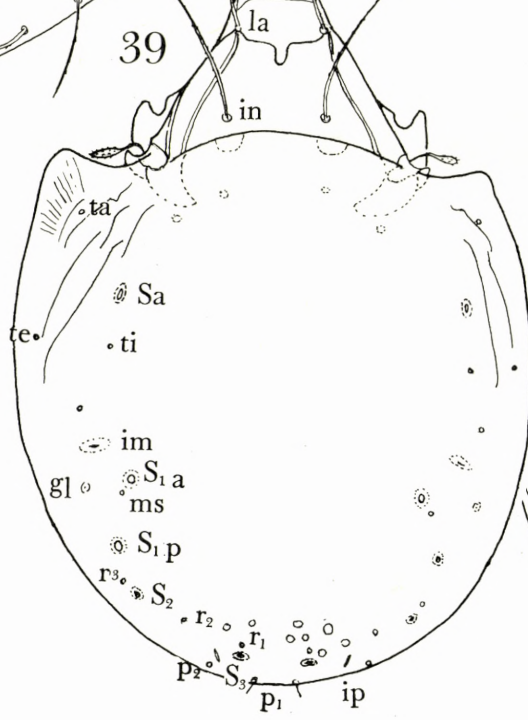
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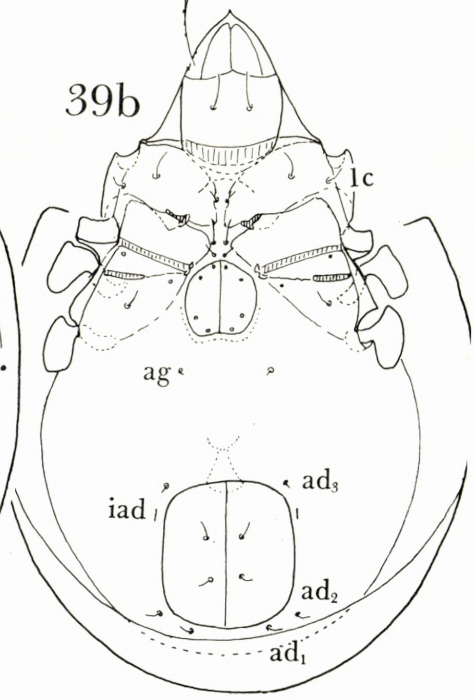
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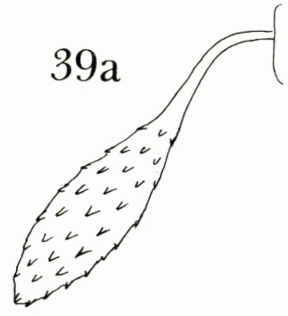
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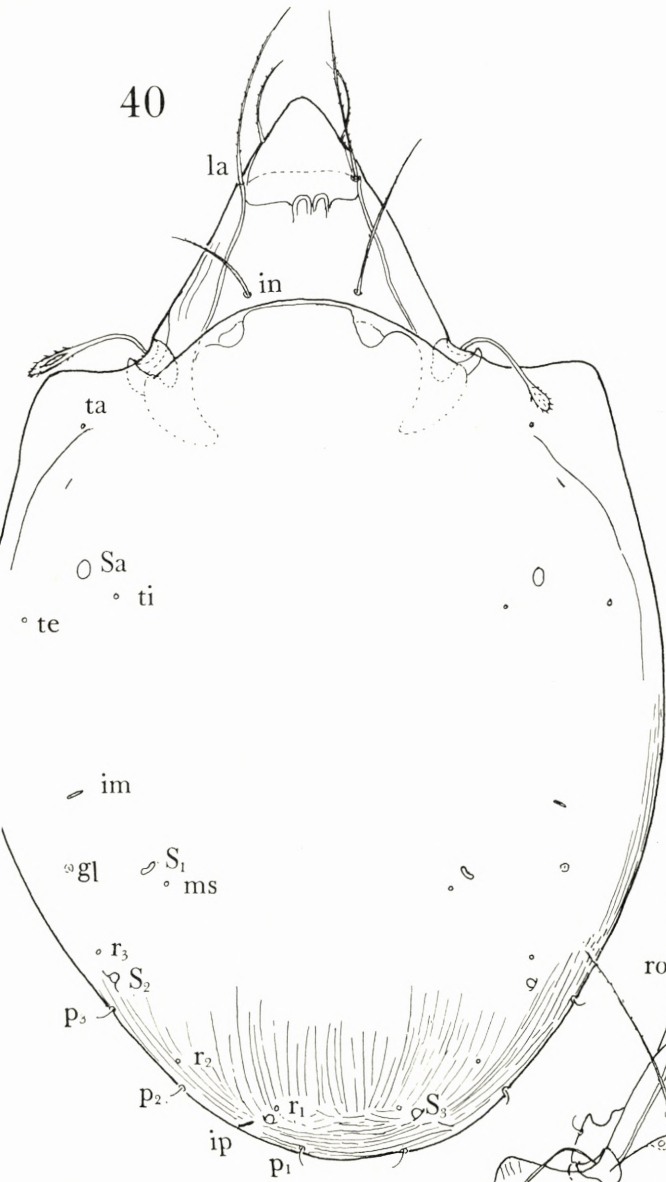
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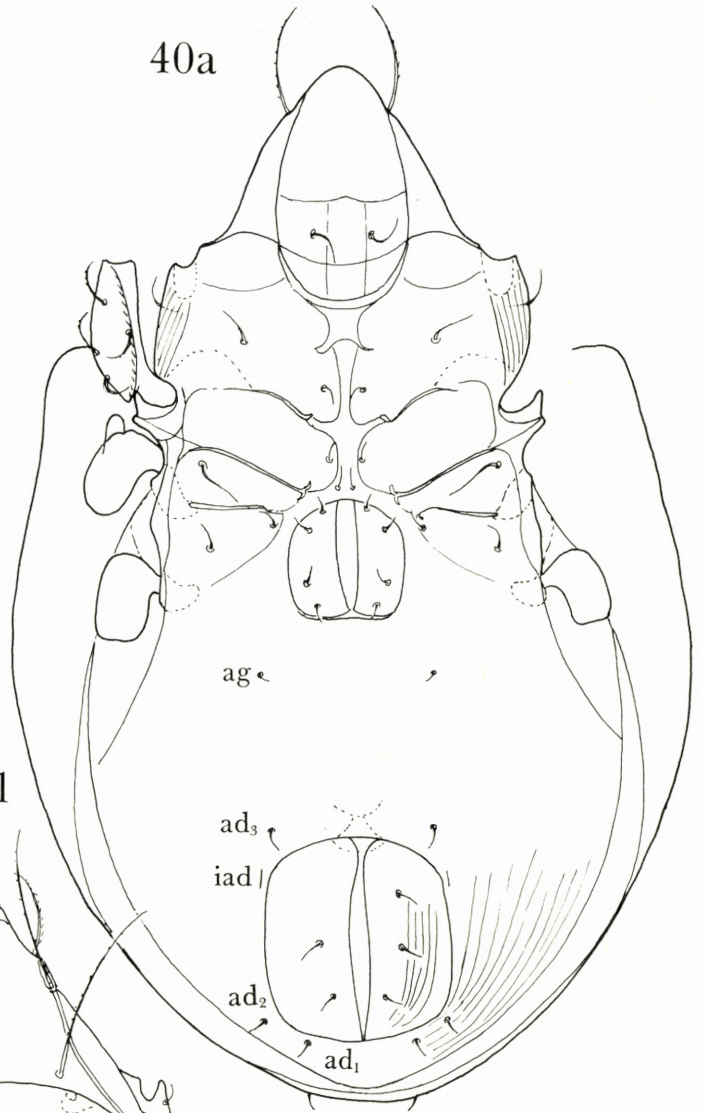
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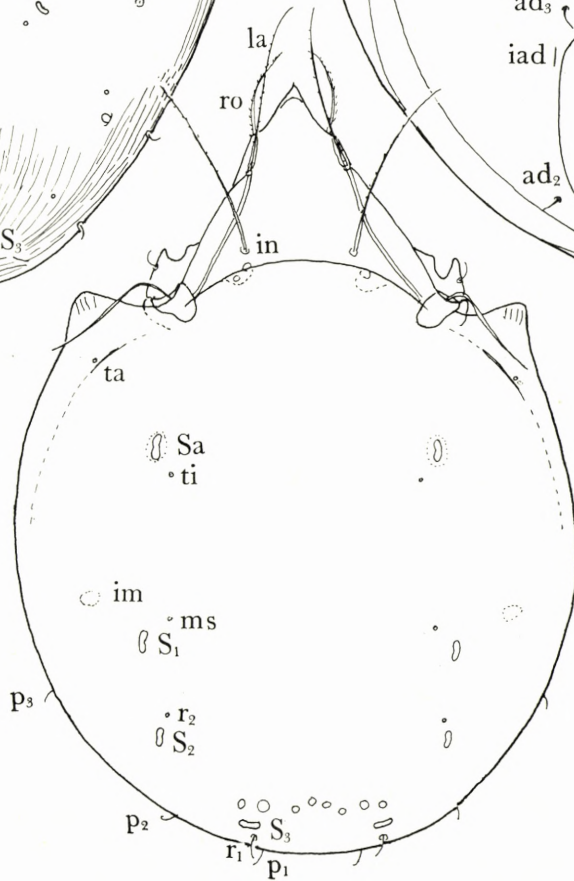
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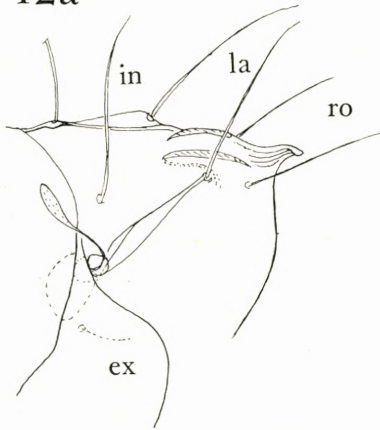
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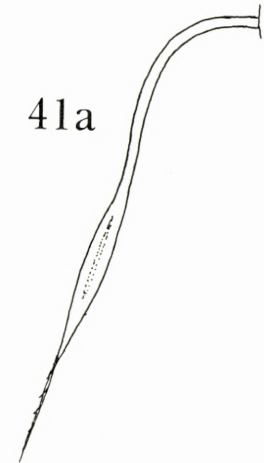
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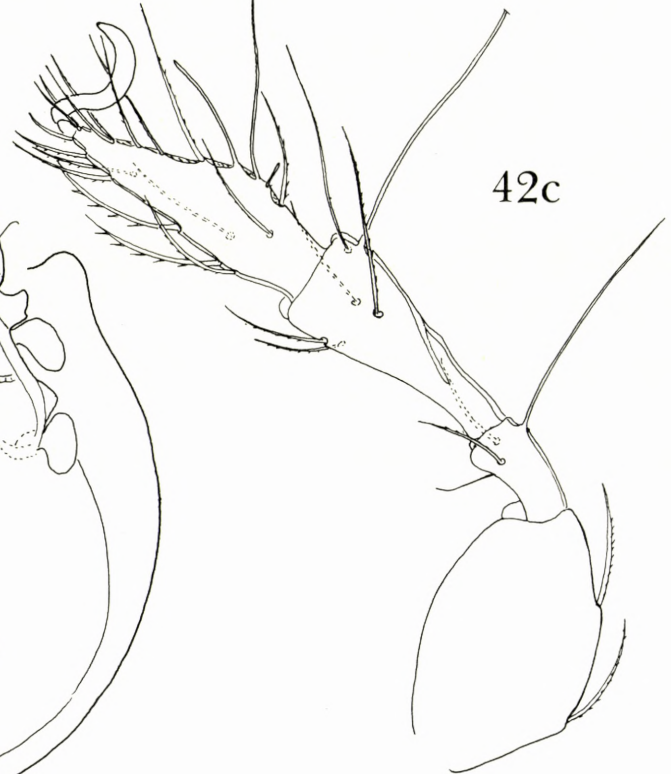
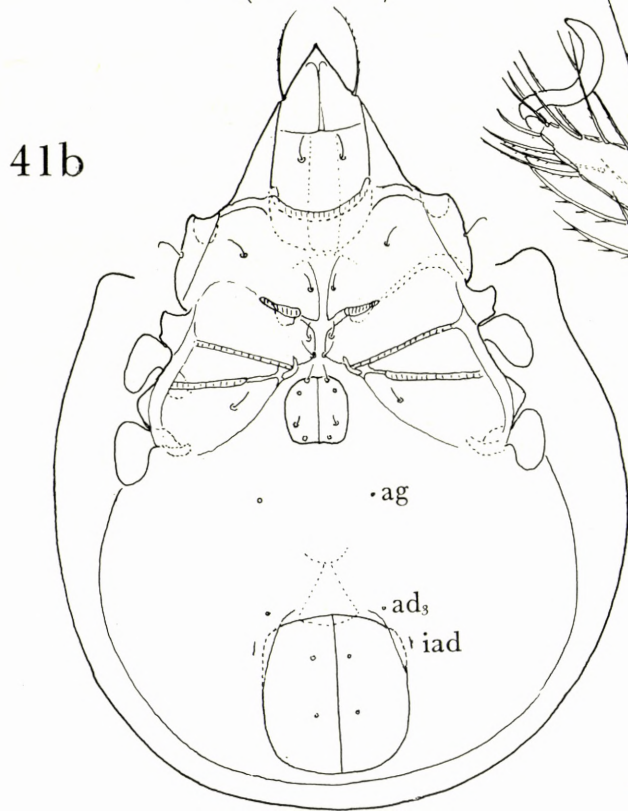
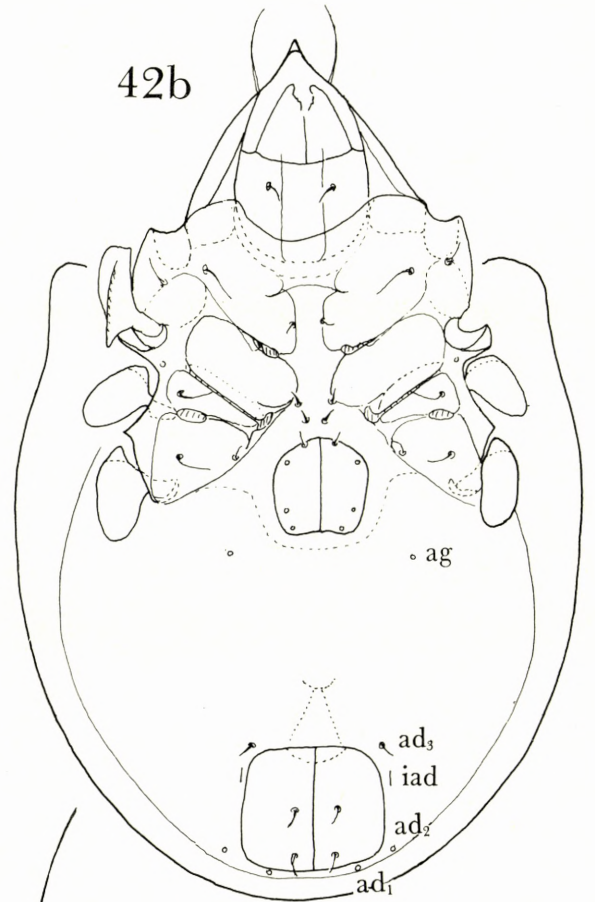
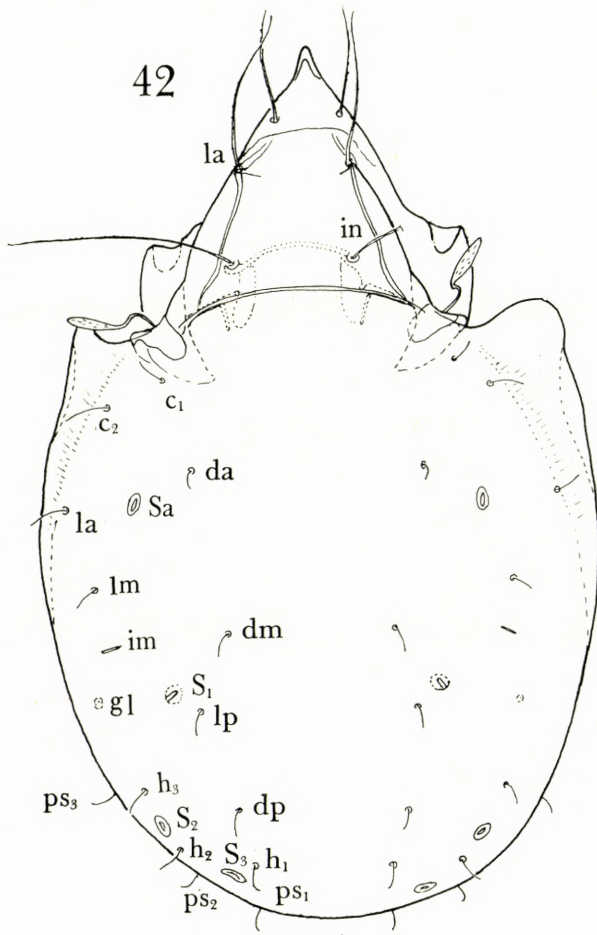


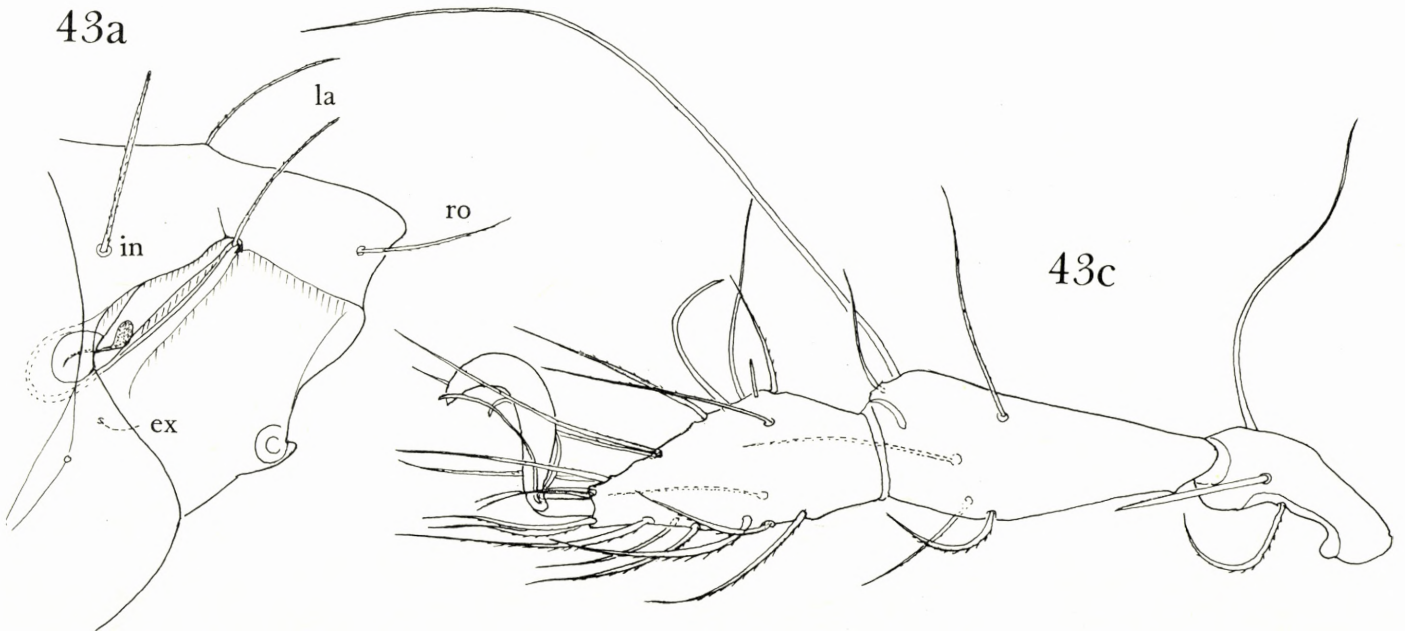
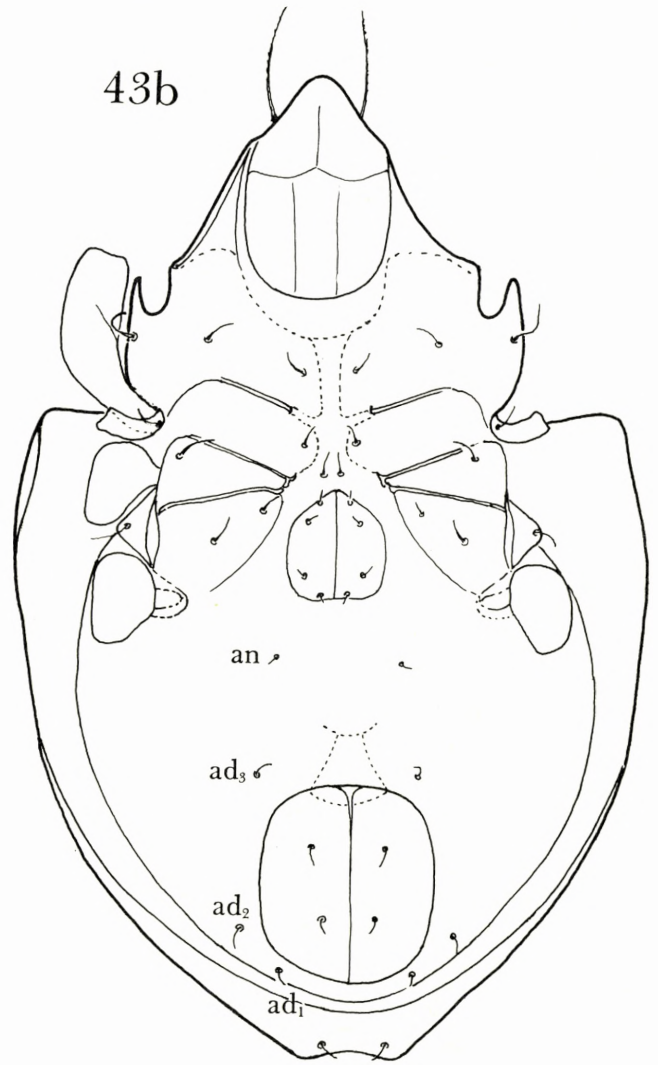
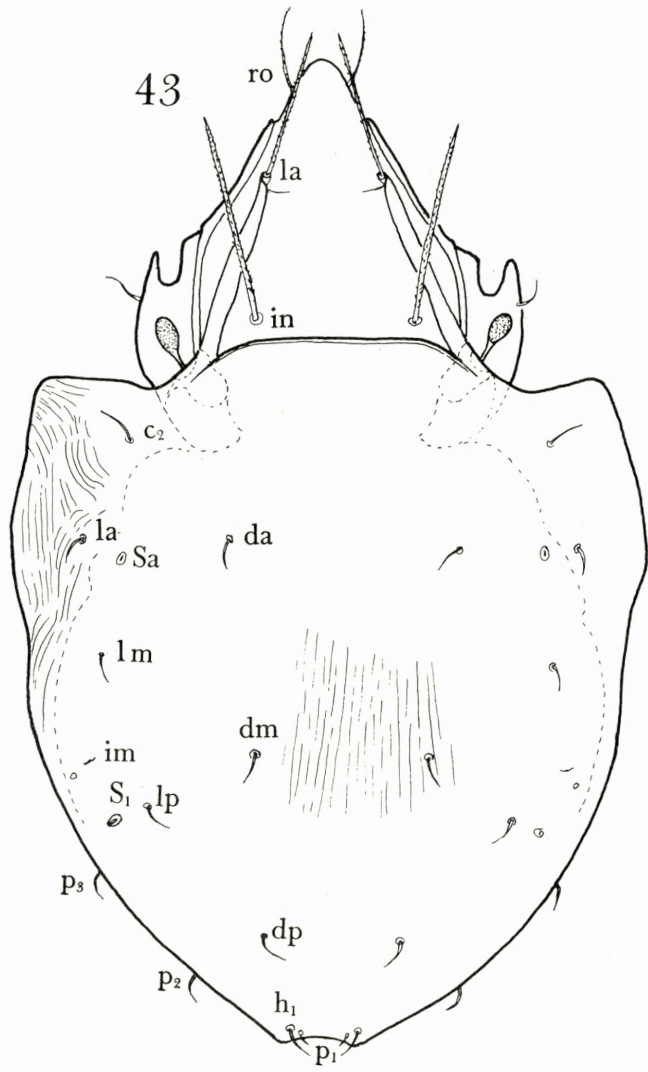
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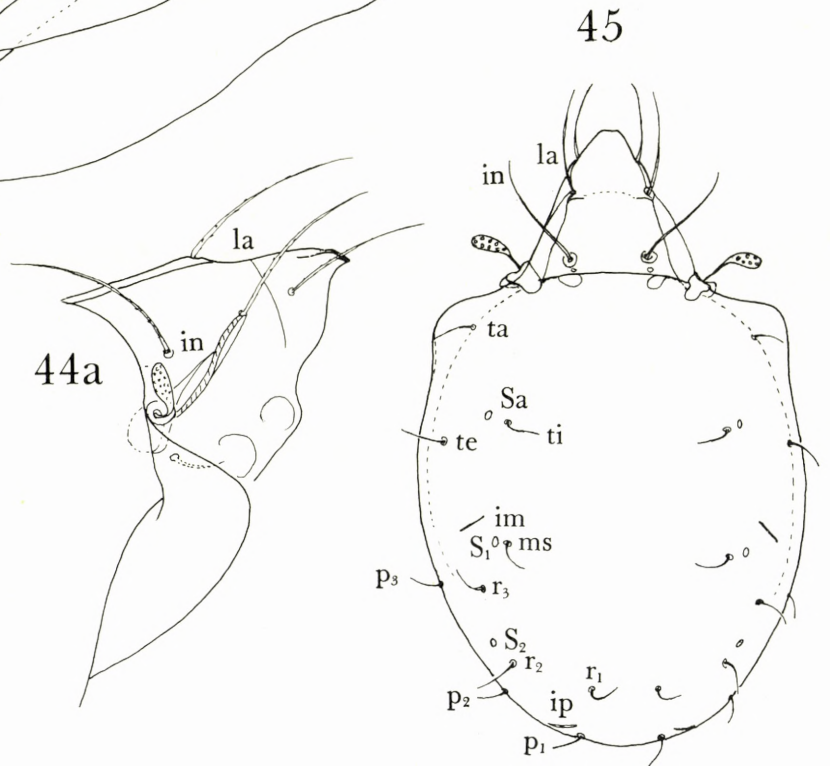
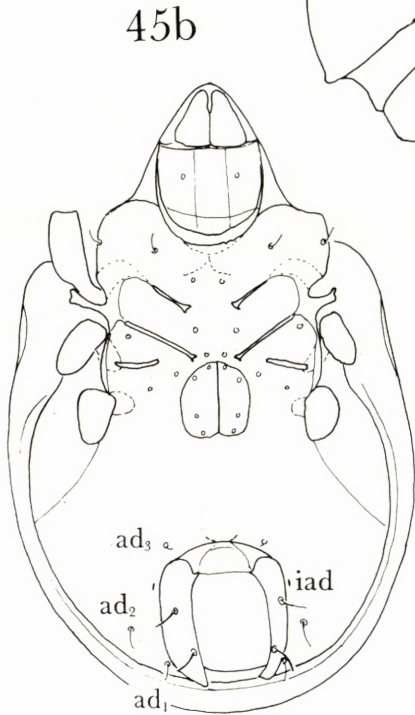
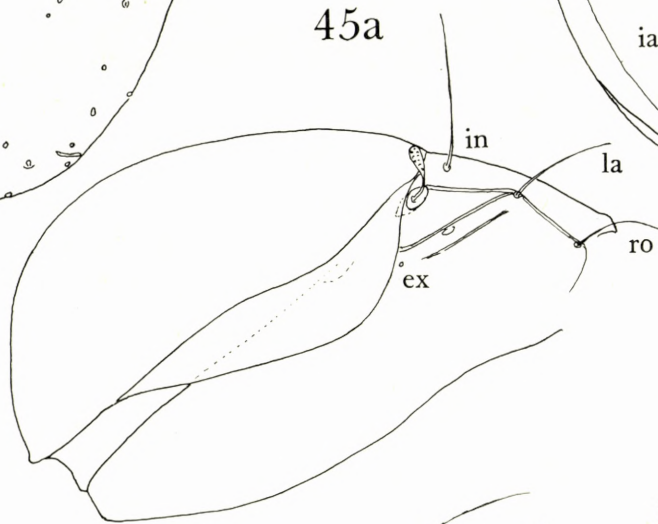
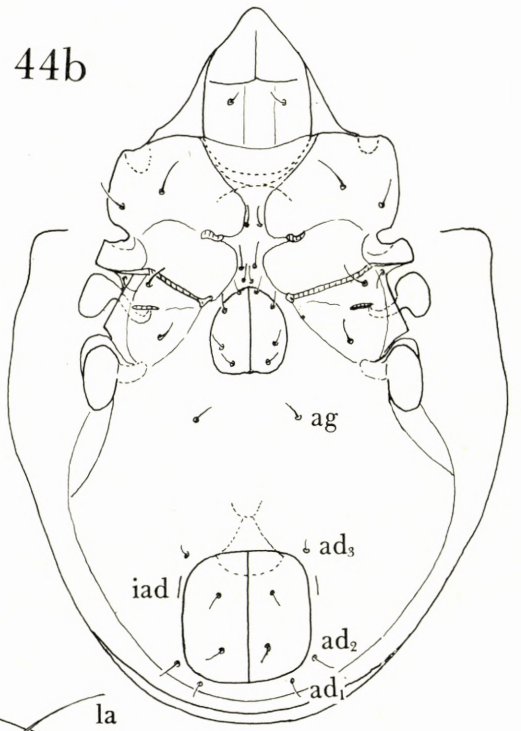
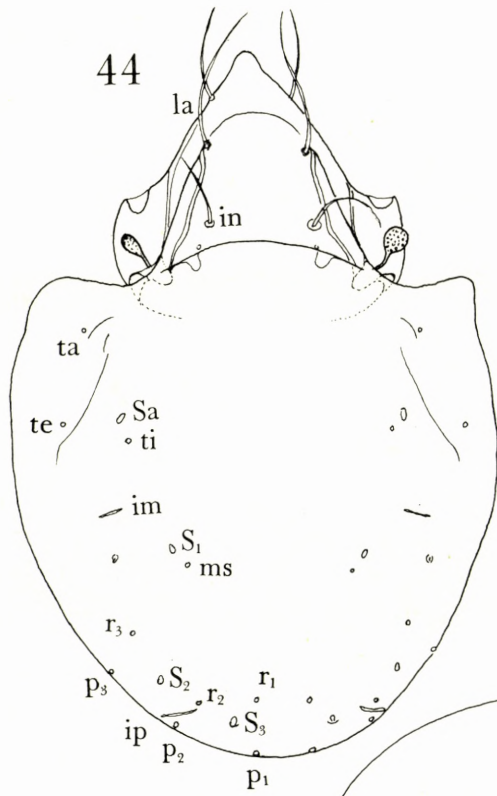


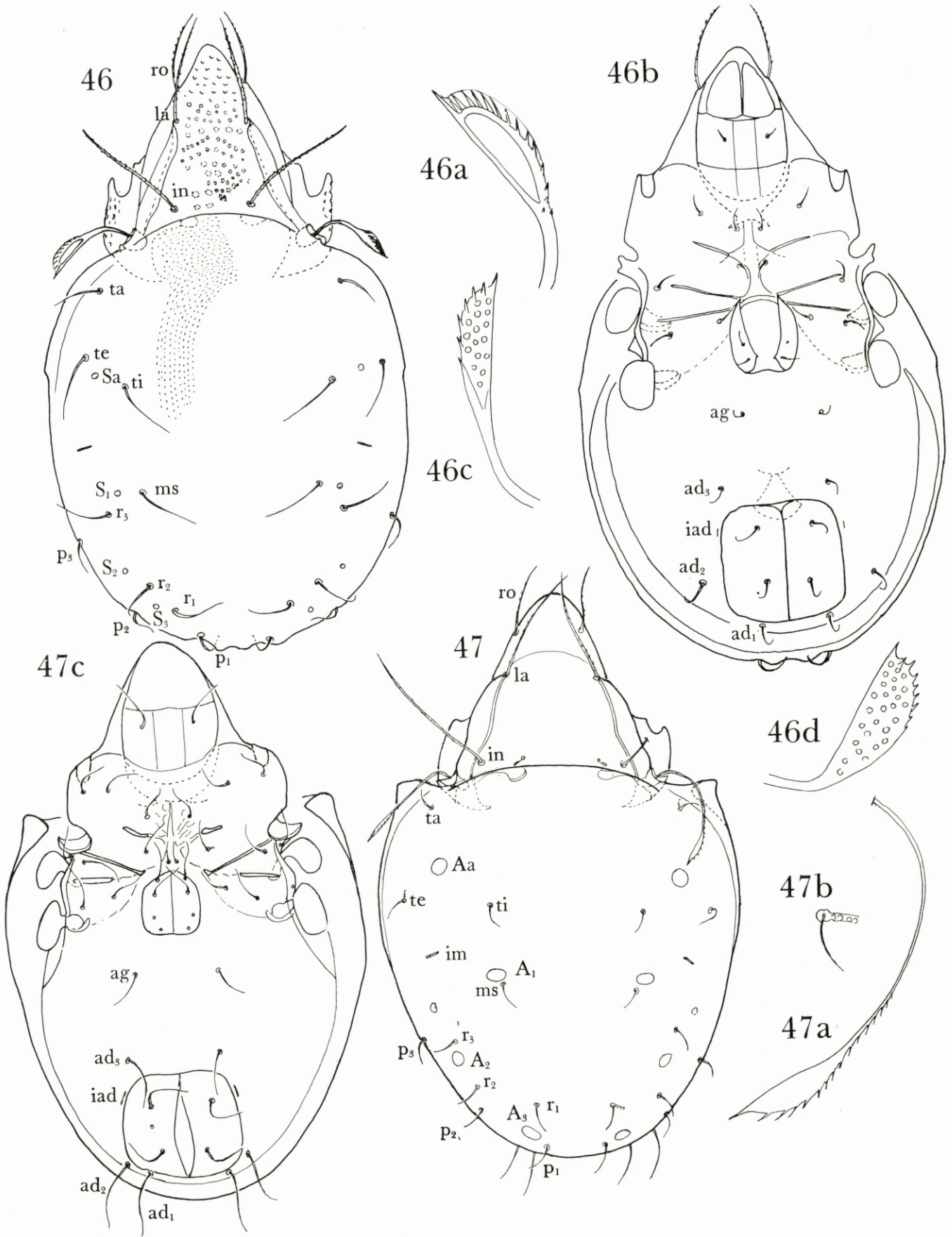
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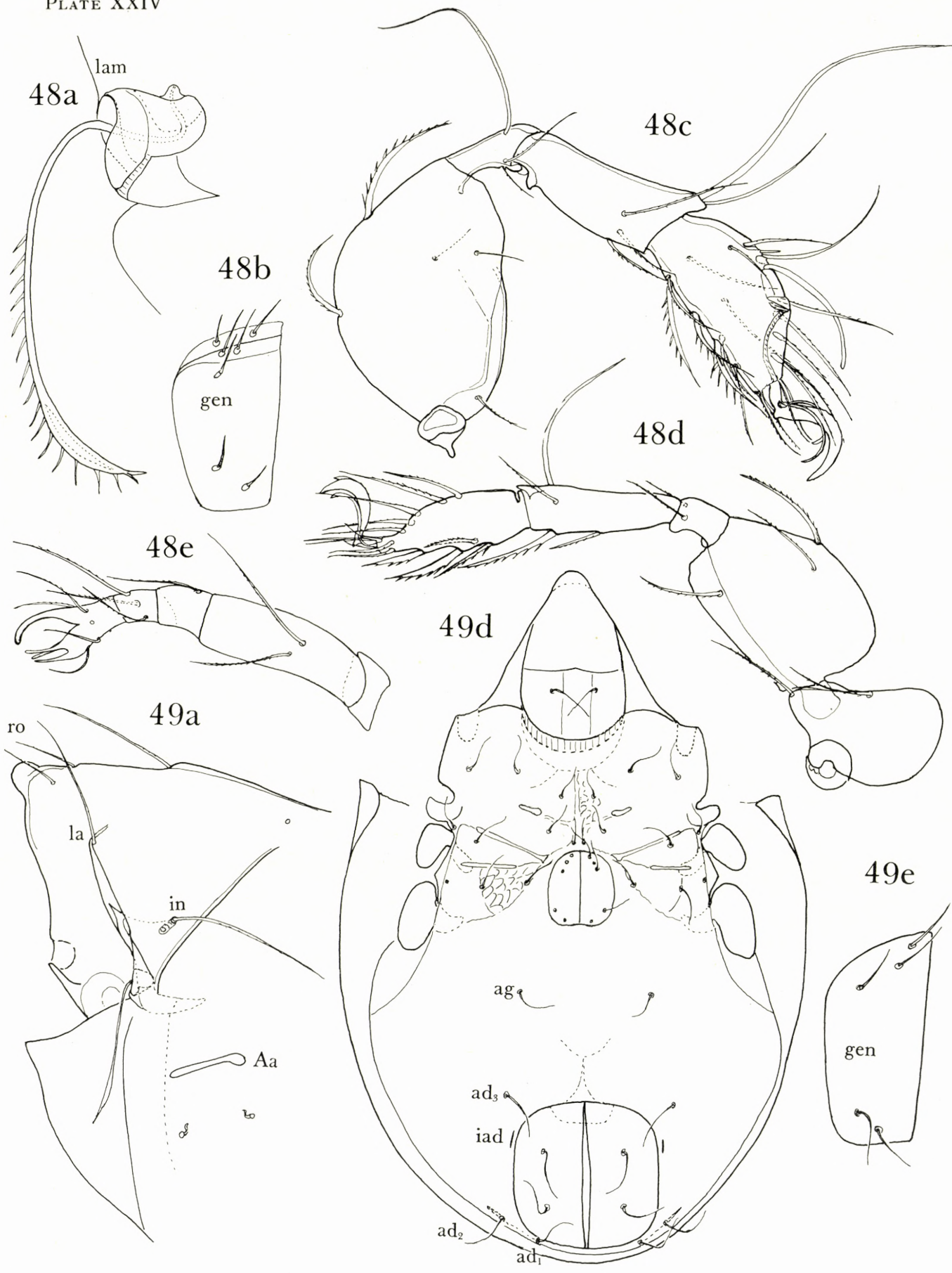




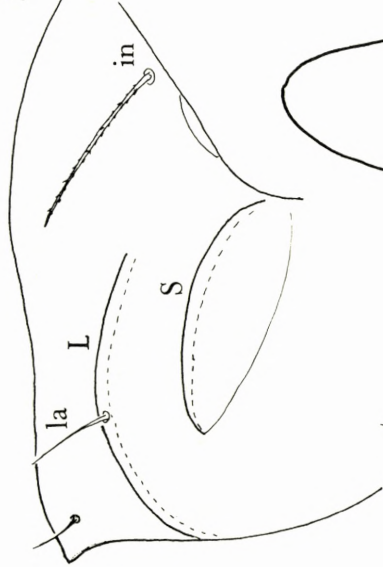








50a

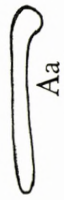


49b

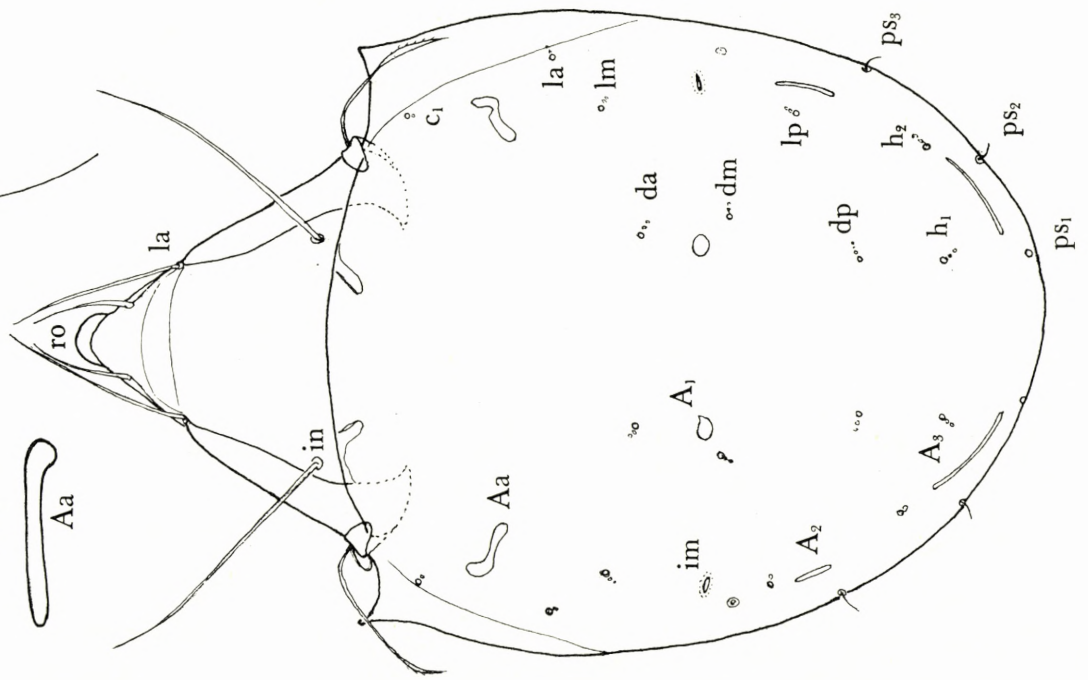
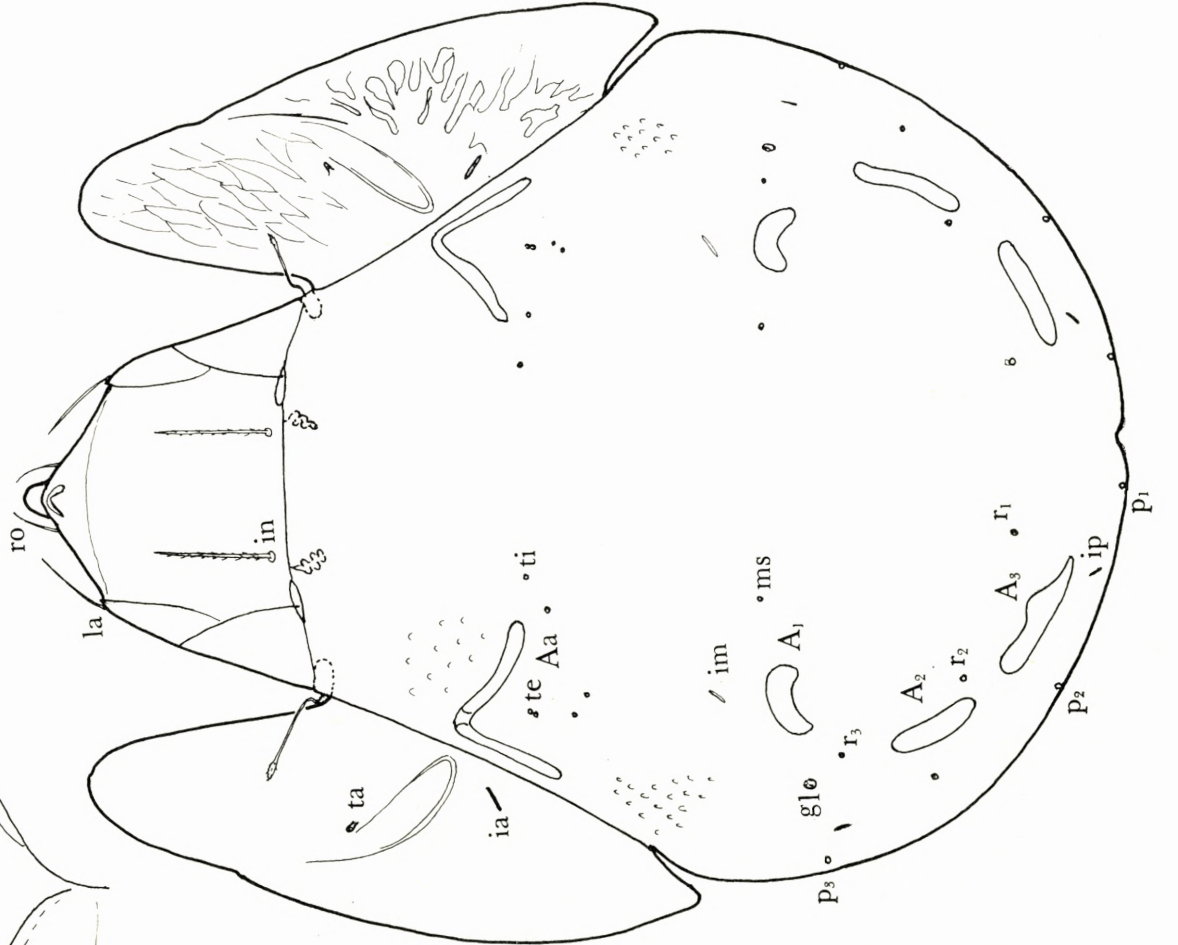


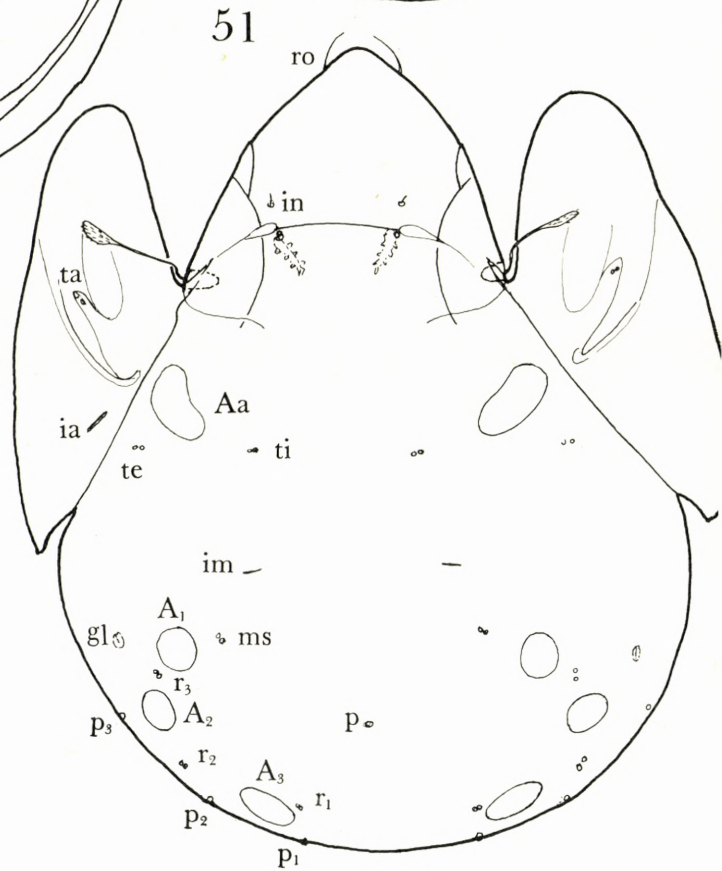
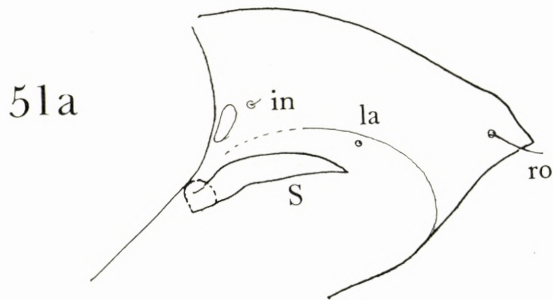
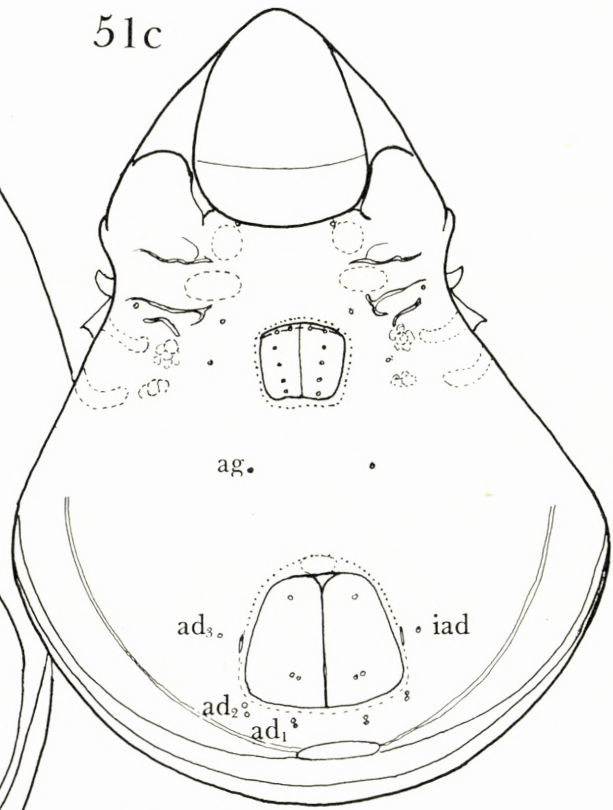
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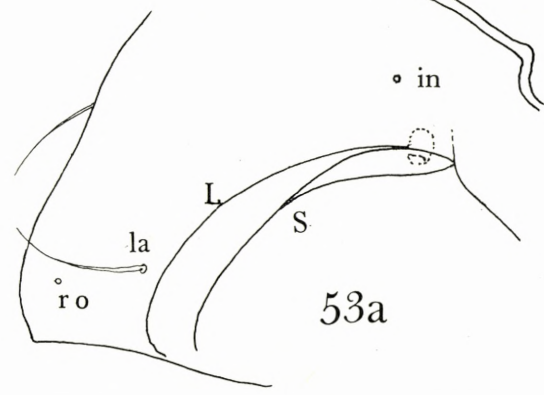
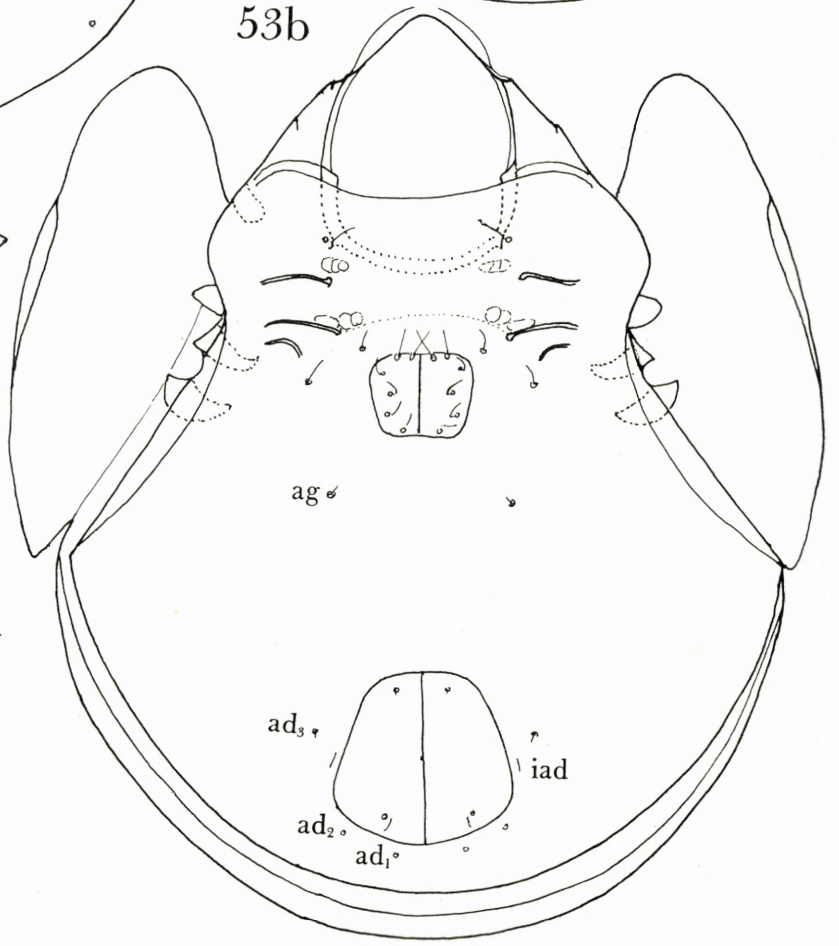
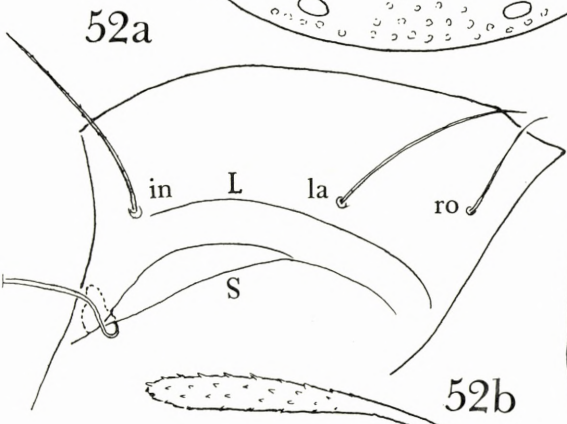
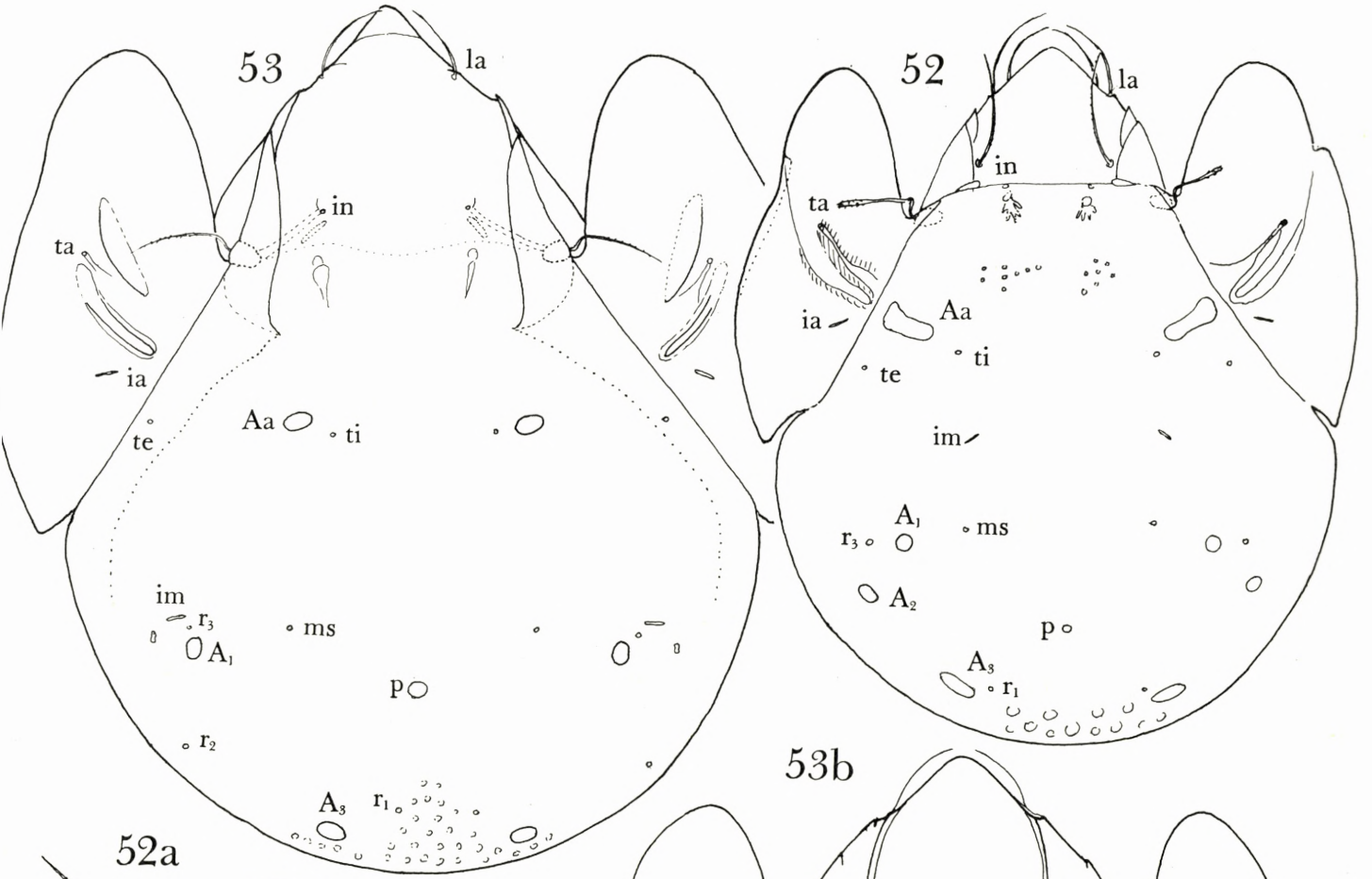
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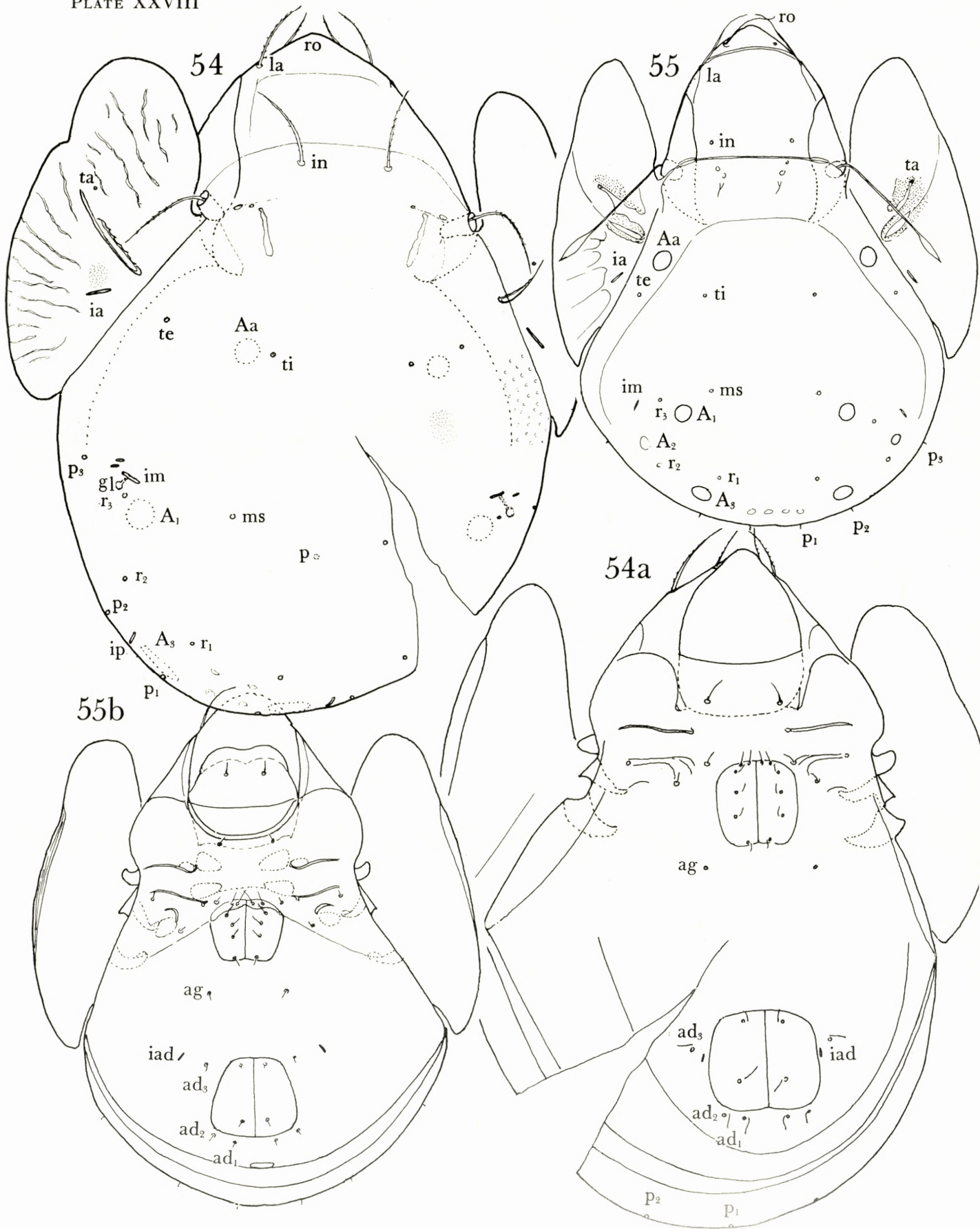


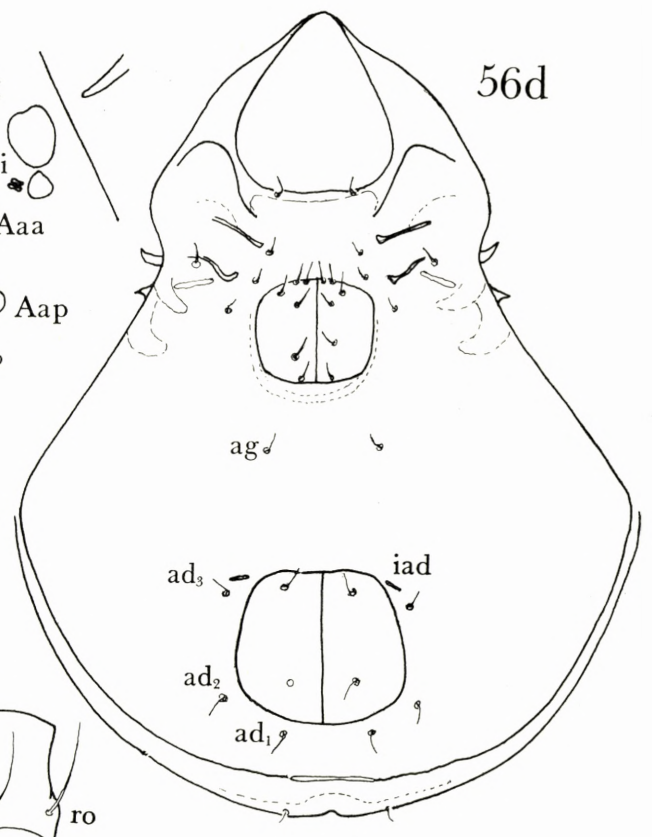
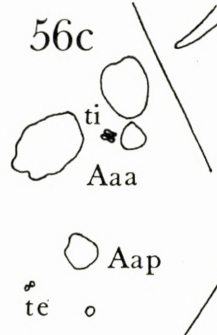
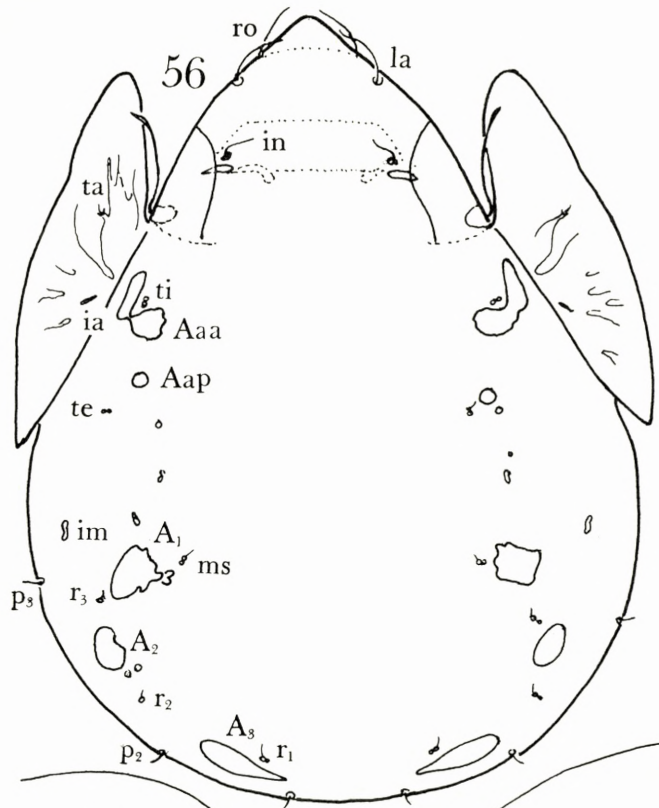
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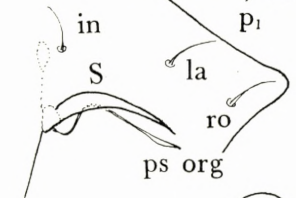




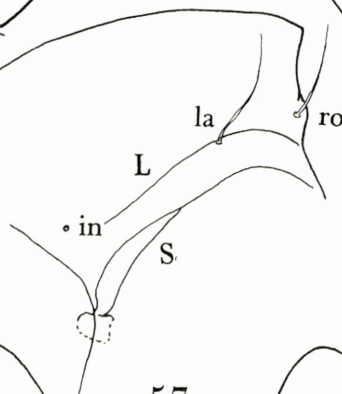




55a



56a

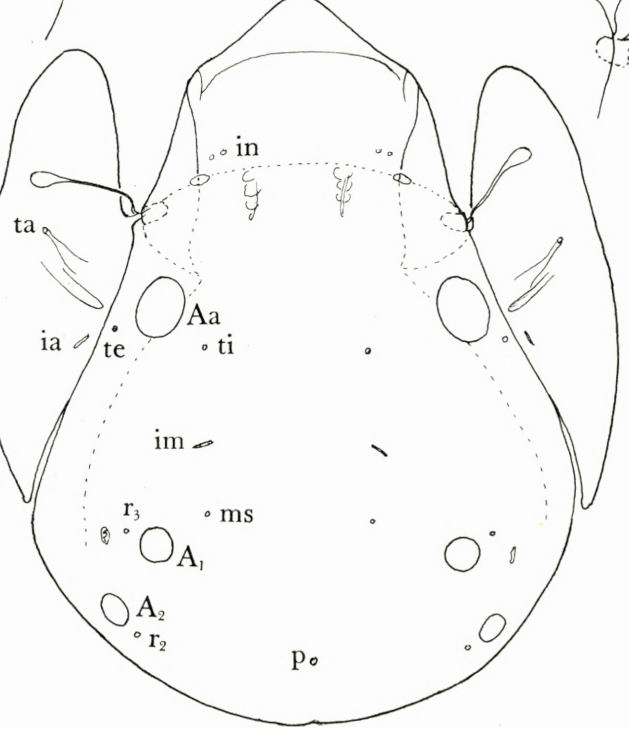


56b

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57b



57a

