

Microgyniina, a new group of Mesostigmata.

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With 6 Text-figures.

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Everybody who has an extensive experience of collecting acarina is fully aware of the fact that the greatest attention must be paid to the investigation of as many different biotopes as possible if one wishes to explore the fauna of a certain locality. It is well known that while some species occur almost anywhere where there is some decayed leaves or moss other species being greatly specialized are found only in very restricted places, where, on the other hand, they may be collected in great numbers. Thus, for instance, *Sejus togatus* K has in Sweden only been found under the bark of old tree-stumps, oak as well as spruce and pine, but nowhere else. The exceedingly rare *Celaenopsis cuspidata* Kr. has been found in the same biotope as well as *Polyaspinus cylindricus* Berl. and *Dipolyaspis sansonei* Berl.

It is therefore not surprizing that the two new species here described, representing two new genera, *Microgynium* and *Microsejus*, and two new families for which it has been necessary to establish a new cohorts, the *Microgyniina*, have also been found under the bark of old tree-stumps and roots. They were discovered under the bark of decayed tree-roots and under the bark of old tree-stumps by dr. K. H. Forsslund in the course of his investigations on the fauna of the forest soil carried out by the entomological department of the R. Swedish institute of experimental forestry at Kulbäcksliden and Svartberget in N. Sweden. Subsequently they were found by Mr. N. Bruce at Södertelje and by the author at Sjöarp in Blekinge s. Sweden, everywhere in the same biotope. They are therefore apparently widely distributed, although they have hitherto been completely overlooked, and it is to be expected that they will be found also in other parts of Europe, when the fauna of the old roots and tree-stumps be thoroughly investigated.

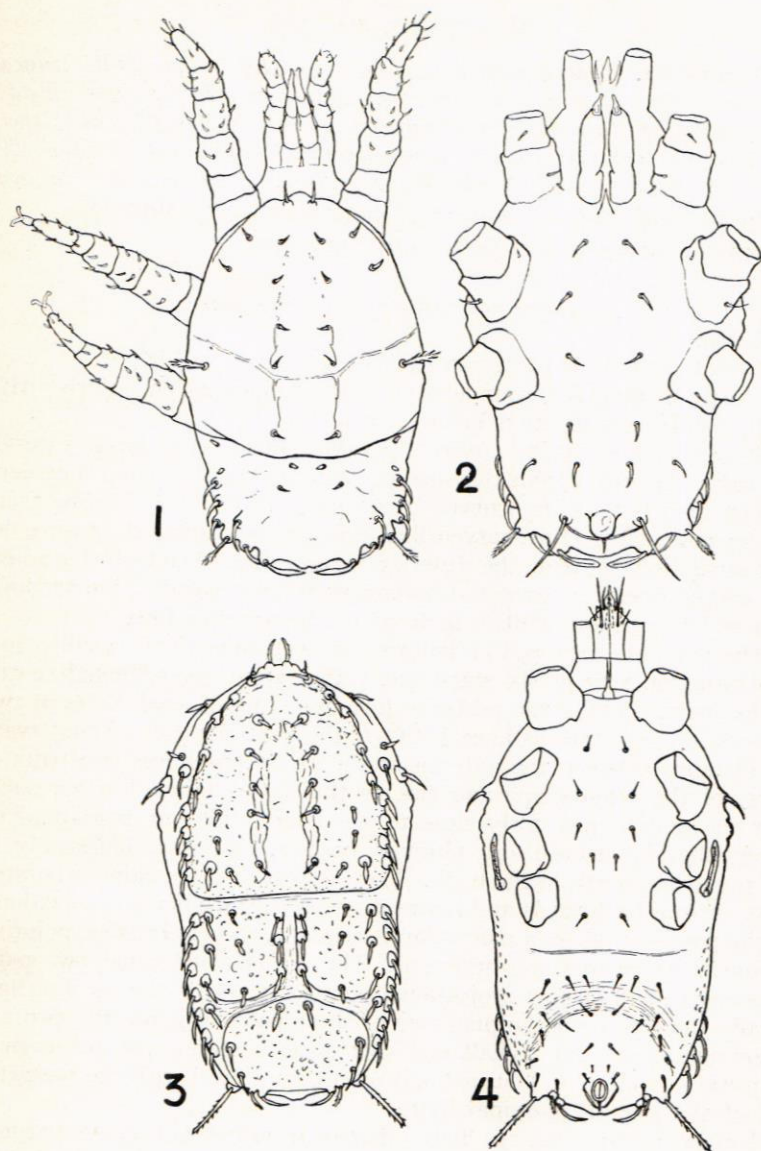


Fig. 1—4. *Microgynium rectangulatum* nov. gen. nov. spec.

1. Larva, dorsal view. 2. Larva, ventral view. 3. Nympha, dorsal view
4. Nympha, ventral view.

Microgynium nov. gen.

Diagnosis. Body elongated, slightly constricted in the middle, truncated posteriorly. Dorsal side faintly areolated, covered by three shields. Male genital aperture small, oval, between coxae III. Female genital aperture a small, transverse fissure between coxae IV. Sternal shield weakly chitinized divided in two shields. Epigynial shield divided in two. Peritrema short. Legs I with two claws but without peduncles.

Type: *Microgynium rectangulatum nov. spec.*

*Microgynium rectangulatum nov. spec.**Larva.*

Length 180 μ , width 120 μ . Colour almost white.

Shape rectangular, rounded anteriorly, truncated posteriorly, with small, median constriction behind coxae III.

Dorsal side (fig. 1) covered by two shields, the large anterior one being separated from the smaller posterior one by a fine but very distinct semicircular line, curved backwards. In front of this line there is a second, rather faint, curved line, possibly indicating the future demarcating line between the anterior and median shield of the adult. The curved lines are connected by two very faint, parallel, longitudinal lines which continue a little in front of the anterior line.

The hairs are arranged as follows: on both sides of the median line a longitudinal row of six small but rather stout hairs, including the vertex hairs. Behind the posterior line two pairs of small hairs in two transverse rows, the distance between the posterior hairs being twice the distance between the anterior ones. At the shoulders two pairs of hairs, of the same shape and size as the dorsal hairs. Further back, near the middle and fairly close to the lateral side one pair of much larger, slightly clavate and plumose bristles. Marginal hairs only in the posterior fourth of the body. They consist of three pairs of pointed hairs, curved backwards and inserted on low, hemispherical projections. At the posterior angles a pair of large, straight, clavate bristles, pointing obliquely backwards and outwards. The posterior edge has two pairs of pointed hairs on low projections, pointing towards the median line. Finally there is a submarginal row of three pairs of hairs, the two anterior ones being very small and short, the posterior one on a small projection, pointed and curved and placed on a level with the posterior one of the lateral, marginal hairs.

Ventral side (fig. 2). Tritosternum with small, conical trunk, thus differing from the *Sejus*-type. No chitinized sternal shield; in the intercoxal portion three pairs of sternal hairs, hairs I on a level with the anterior side of coxae II and closer to the median line than to the coxae; hairs II a little further apart and a little behind the middle of coxae II, hairs III on a level with the middle of coxae III. In the

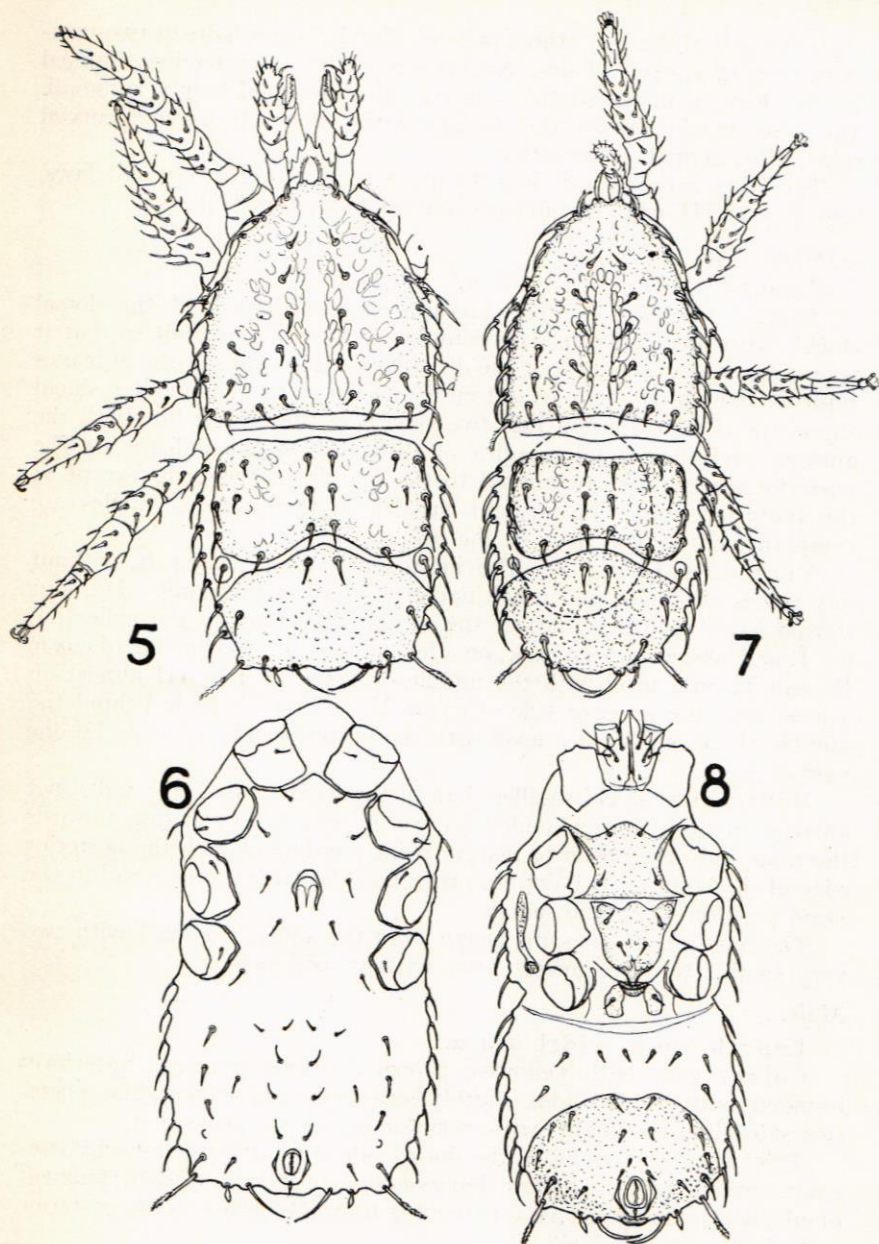


Fig. 5—8. *Microgynium rectangularum*.

5. Male, dorsal view. 6. Male, ventral view. 7. Female, dorsal view.
8. Female, ventral view.

posterior half of the body three pairs of slightly larger hairs in two transverse rows of 2, resp. 4 hairs. Anal aperture slightly protruding, flanked by two long, pointed, slightly curved hairs; postanal hair very small. The raised portion behind the aperture with a sharp, transverse, curved ridge. No stigmata discernible.

The legs rather stout, legs I only with two sharply curved claws, legs II and III with ambulacres and well developed claws.

Nympha. (figs. 3 & 4.)

Length 340 μ , width 160 μ .

Dorsal side (fig. 3). The texture, general shape and the dorsal shields with their hairs are very similar to those of the adult so that it is only necessary to point out the differences. The anterior shield leaves unprotected a larger strip of soft cuticle at the sides. The median shield shows traces of a division into two shields in the middle but both the anterior and the lateral margins of these shields are indistinct. The posterior shield does not extend to the margin of the body except at the posterior side. The straight bristles at the posterior angles are comparatively longer than in the adult.

Ventral side (fig. 4). The intercoxal part is very soft, without any traces of shields and much narrower than in the adult. The four sternal hairs are placed nearer the median line than in the male (fig. 6). Hair I placed further back, on a level with the anterior side of coxae II; hair II on a level with the middle of coxae II, hair III almost on a level with the anterior side of coxae III, hair IV a little behind the middle of coxae III; on a level with the posterior side of coxae IV one pair of hairs.

Ventri-anal shield smaller than in the female, with only indistinct anterior margin, more rounded anteriorly and not extending towards the sides, only the posterior margin being contiguous with the posterior edge of the body. The hairs are present in the same number and in the same position as in the female.

The legs are of the same shape as in the adult. Tarsus I with two very small, strongly curved claws without peduncle.

Male.

Length 320 μ , width 144 μ .

Colour very light yellowish brown. Shape elongate, anteriorly rounded, with parallel sides, slightly constricted near the middle, posterior side almost straight, with very small central projection.

Texture. The cuticle of the dorsal side is faintly areolated by irregular, oval or round, shallow depressions except for a median, longitudinal, slightly depressed area, extending from the vertex to the posterior end of the second shield.

Dorsal side (fig. 5) covered by three shields, the anterior one of which covers the anterior half of the body, while the two others, one

behind another, cover the posterior half, being separated by a narrow streak of soft cuticle, curved slightly forwards in the middle. The hairs are generally inserted on small, semispherical projections; they are arranged in the following way on the anterior shield: on the anterior shield nine pairs of marginal, fairly large and curved hairs, the vertex hair included, the posterior hair being inserted at the posterior angle of the shield. On both sides of the median line a longitudinal row of four, almost equidistant hairs, along the posterior margin three pairs of submarginal hairs and in the posterior half of the shield two pairs of hairs, one behind the other nearer to the margin than to the middle.

The median shield is excavated at the posterior margin, with rounded posterior angles, leaving unprotected a triangular area between the median and the posterior shield, where there is a hair, inserted on a large, semispherical projection. The hairs are arranged in two longitudinal, median rows of three pairs, closer together than those of the anterior shield, three pairs of lateral, marginal hairs and two pairs of hairs close to the marginal hairs, on a level with the first and second of them; at the posterior margin one pair of hairs.

The posterior shield extends to the margin of the body and has one pair of hairs near the median line, close to the anterior margin, two pairs of lateral hairs and three pairs of very characteristic hairs at the posterior margin, the exterior one being placed in the posterior angle and straight, slightly clubshaped and pointing obliquely outwards and backwards, the median one is bent strongly towards the median line and slightly curved, the median pair is very short and blunt and placed near the median hair; finally there is one lateral and one posterior, submarginal hair.

Ventral side (fig. 6) quite soft, without any distinct shields. In the posterior half of the body the lateral edge has a row of seven pairs of curved hairs, all inserted on low projections, and at the shoulder there is one hair. The four sternal hairs are placed as follows: hair I close to coxa I, hairs II almost twice as far apart as hairs I and a little behind the middle of coxae II, hairs III about halfway between coxae III and the genital aperture and a little in front of the middle of coxae III, hairs IV as far apart as hairs I, between coxae III and IV. Near the posterior side of coxa IV and close to them one pair of hairs. In the posterior half of the body two longitudinal rows of four small, hairs close to the median line and two longitudinal rows of three larger, curved hairs and one much smaller hair, about twice as far from the median line as from the lateral margin; near the posterior margin a transverse row of four hairs.

Genital aperture very peculiar in so far as it is not a more or less circular opening closed by an operculum, hinged to the posterior margin of the aperture. It is a horse-shoe-shaped slit, the opening being closed by a tongue-shaped shield which without any suture or

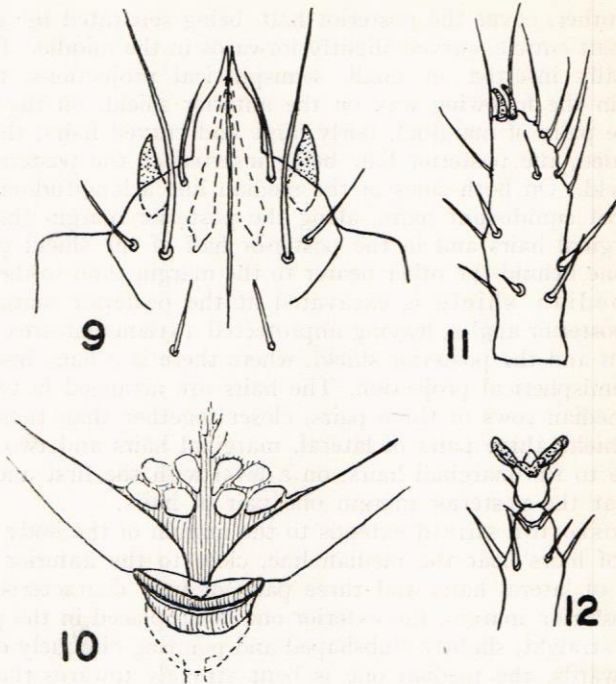


Fig. 9—12. *Microgynium rectangularatum*.

9. Hypostoma of male. 10. Female genital aperture. 11. Top of tarsus I.
12. Top of tarsus II.

hinge projects forwards from the ventral side. It is placed on a level with the middle of coxae III.

Gnathosoma.

Epistoma (fig. 5) triangular, with two pairs of lateral teeth.

Mandibles with small, narrow chela; lower jaw with sharp terminal tooth, behind which there are three smaller, sharp teeth of equal size and behind them a larger tooth of the same size as the terminal tooth. Behind this the edge is raised to a thin, rounded blade. Upper jaw with acute terminal tooth, behind which there is a row of about 8 small, sharp teeth and one larger tooth.

Hypostoma (fig. 9). Maxillary lobes narrow, straight, acutely pointed; maxillary plates without fringes. Of the hypostomatic hairs the anterior one is placed on the median side of the maxillary lobe, which it exceeds slightly in length; hairs II very long, almost thrice as long as hairs III and inserted close to them but a little further back.

The shape of the mandibles shows that *Microgynium* must be of carnivorous habits, a view which is corroborated by the fact that the excretory organ is generally full of guanidine crystals.

The legs (figs. 11 & 12) are short, with numerous, curved, pointed hairs, inserted on low, wart-like projections, especially on legs I. Tarsi I less tapering than the others, with numerous tactile hairs in the distal end. Tarsi I without peduncles, with two short, blunt, strongly curved claws. Tarsi II—IV with peduncles and well developed claws. Length of legs: I 180 μ , II 140 μ , III 140 μ , IV 180 μ .

Female (figs. 7 & 8).

Length 360 μ , width 180 μ .

General shape, texture, number of shields and hairs the same as in the male. It is therefore necessary to describe only the ventral side of the female.

Ventral side (fig. 8). Sternal shield weakly chitinized as in the male. It is divided into two shields, each carrying two pairs of hairs. Anterior shield with deeply concave sides and long, sharp anterior and posterior angles. Anterior margin convex in the middle, the posterior margin quite straight. Hair I situated near the anterior margin, close to the middle, hair II near the lateral margin, behind the middle of coxae II. The posterior shield is triangular in outline and has the anterior margin shaped as in the anterior shield. The posterior end is round, with a small incision in the middle. Hair III near the lateral margin, a little in front of the middle of coxae III, hair IV near the middle, a little in front of the posterior side of coxae III. Both shields are almost transparent and therefore extremely difficult to see.

The genital aperture is placed between coxae IV and has a most peculiar shape which is unique amongst the *Mesostigmata*. On superficial view one sees a faint, transverse, slightly curved fissure (fig. 10), the walls of which are strengthened by two strongly chitinized, curved bars, which appear to be thickenings of the wall a little below the surface. In front of the fissure there is a strongly chitinized tooth, which seems to belong to the armature of the anterior wall of the vagina and the tip of which protrudes backwards a little between the bars, which form the anterior resp. the posterior lip of the aperture. On both sides of the genital aperture a small, oval shield carrying one hair. These two shields are obviously homologous to the epigynial shield, which has apparently disintegrated in two shields, a feature which is quite as strange as the shape of the genital fissure.

This type of genital aperture, a small, transverse fissure, without any shields or any other structures adapted to the purpose of opening or closing the aperture, is a feature only met with in the genus *Microrosejus*. It seems the more strange considering the fact that the single egg found in some females is exceptionally large, almost completely filling the posterior half of the body. It seems evident that either the egg must be capable of changing its form to such an extent that it may pass through the small opening, or else the larva escapes only after the death of the mother, as is the case in some *Oribatei*.

The gnathosoma does not differ from that of the male.

The legs are also similar to those of the male, only legs IV being slightly longer, measuring 210 μ .

Microsejus nov. gen.

Diagnosis. Body flat, oval. Dorsal side covered by four shields. Male genital aperture very small, oval, situated between coxae III. Female sternal shields I and II fused to a trapezoidal shield, shields III and IV coalesced to a transverse, semilunar shield. Genital aperture a small, curved fissure between coxae IV. Epigynial shield triangular, without connection with genital aperture. Stigmata on a level between coxae III and IV, peritremata short. Legs I with two strong claws without peduncle.

Type species: *Microsejus truncicola nov. spec.*

Microsejus truncicola nov. spec.

Nympha (figs. 13 & 14).

Length 290 μ , width 160 μ .

Dorsal side (fig. 14) covered by four shields which, however, leave unprotected the anterior and lateral sides of the body; the hairs are rather short, stout, curved and acutely pointed and inserted on small, semispherical projections. They are arranged in the following way: 10 pairs of hairs along the lateral margin of which the anterior is longer and points forwards, II—V are submarginal, VI, which is inserted at the shoulder, is twice as large as the others and points outwards and VII—X are strictly marginal; four pairs are arranged in a longitudinal row near the middle, three pairs forming a transverse row at a distance of their own length from the posterior margin, further laterally a longitudinal row of four hairs the posterior one of which is at the same time the lateral hair of the posterior row. At the anterior end of the body one pair of large, slightly clubshaped and curved »vertex»-hairs.

The posterior half of the body is covered by three shields which are, however, not as well defined as in the adults. The posterior of these shields covers the posterior $\frac{1}{4}$ of the body and projects a little between the other shields which form a transverse row, their posterior edges being cut off obliquely. They have three longitudinal rows of hairs, viz. a marginal row of seven hairs, a median row of four hairs and one row of five hairs, twice as far apart from the median as from the marginal row. The posterior shield has two pairs of lateral, marginal hairs. The posterior edge of the body has three pairs of large, curved marginal hairs, increasing in size towards the posterior end.

Ventral side (fig. 13) soft, with only faint traces of the anal shield. The intercoxal part has four pairs of small hairs: hair I on a level with the anterior side of coxae II, hair II a little in front of a line drawn between coxae II and III, hair III a little behind the middle of coxae

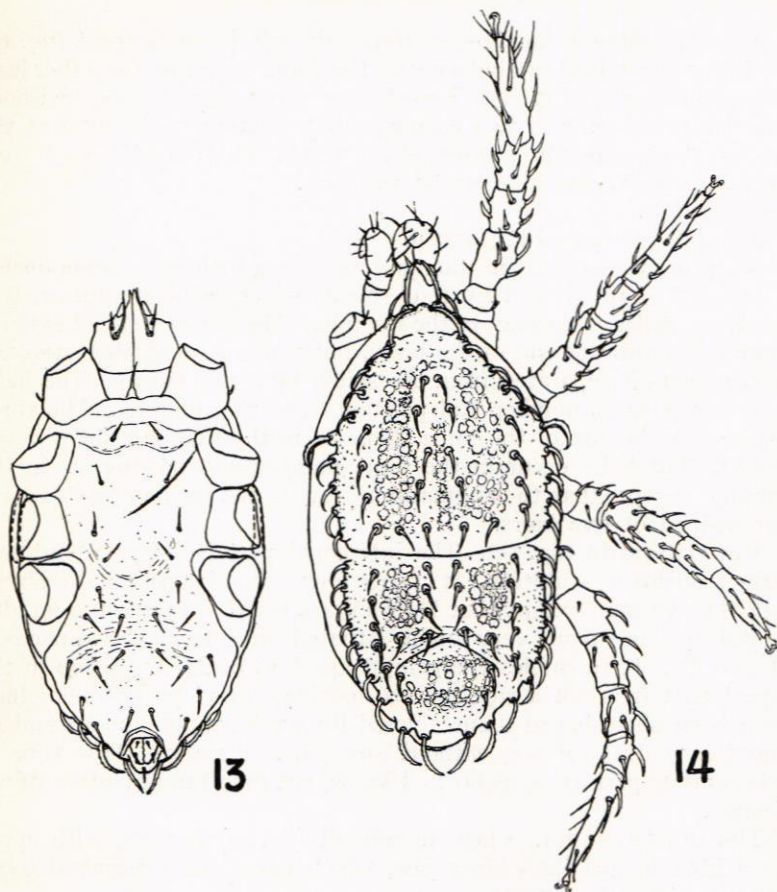


Fig. 13.—14. *Microsejus truncicola* nov. gen. nov. spec.
13. Nympha, ventral view. 14. Nympha, dorsal view.

III and hair IV on a level with the anterior side of coxae IV. The ventral part of the body has nine pairs of hairs, arranged as delineated in fig. 13.

The anal aperture is large and surrounded by a small, oval shield, raised above the level of the body, with free, projecting posterior edge. This feature is commonly found in forms which are able to attach themselves to other arthropods for the purpose of getting transported to other localities. For this reason it seems justified to assume that the nymphae of *Microsejus* may be distributed in the same way. Such a method of dispersal would not be strange in a mite which inhabits a biotope so difficult of access without the help of insects as under the bark of tree-stumps and tree-roots.

The legs differ from those of the adult only in one respect (fig. 19) viz. that tarsi I have ambulacres of the same shape as the other legs.

Gnathosoma (fig. 21). Epistoma very characteristic, without central mucro but with two narrow, pointed lateral teeth bifid at the top and flanked by three short, sharp teeth. The mandibles I have not been able to examine on lateral view.

Male (fig. 15).

Length 320 μ , width 170 μ .

Sculpture the same as in the nymph, only a little more pronounced.

Dorsal side covered by four shields which leave unprotected at the sides smaller areas than in the nymph. The anterior shield extends towards the anterior end of the body, but the mucro which carries the »vertex»-hairs is separated from the shield by a fine suture. The hairs occur in the same number and position as in the nymph. The three posterior shields are of the same shape as in the nymph but are well defined. The hairs occur in the same number and position as in the nymph except that the submarginal row of the median shields have four instead of five hairs.

Ventral side (fig. 15). The intercoxal part is soft, without any distinct shields or sculpture. It carries four pairs of sternal hairs placed as in the nymph, except that hairs IV are inserted nearer the middle. Genital aperture oval, very small, situated on a level between coxae III and IV. It resembles the genital aperture of *Microgynium* in the respect that it is not a ring-shaped opening, closed by an operculum, but a horse-shoe-shaped fissure, closed by a thin, thumblike appendage from the ventral surface, without any joint or suture. This type of male genital aperture is, as far as I know, not found in any other *Meso-stigmata*.

The gnathosoma. Chela mandibuli (fig. 22) narrow, with upper jaw a little longer than lower jaw, which has a sharp terminal tooth and two other short teeth.

The legs are far more developed than in *Microgynium*, with numerous rather stout, curved hairs. All tarsi tapering. Tarsus I with a bunch of tactile hairs at the top: claws sessil. Legs II—IV with peduncles and normal claws. Length of legs: I 290, II 250, III 250, IV 330 μ .

Female (figs 16 & 17).

Length 370 μ , width 180 μ .

Colour and texture the same as in the male. Shape a little shorter and broader.

The dorsal side (fig. 16) has the same number of shields as the male and the number and position of the hairs is the same.

Ventral side (fig. 17). Sternal shields very weakly chitinized, their outlines being impossible to trace without the use of oil-immersion.

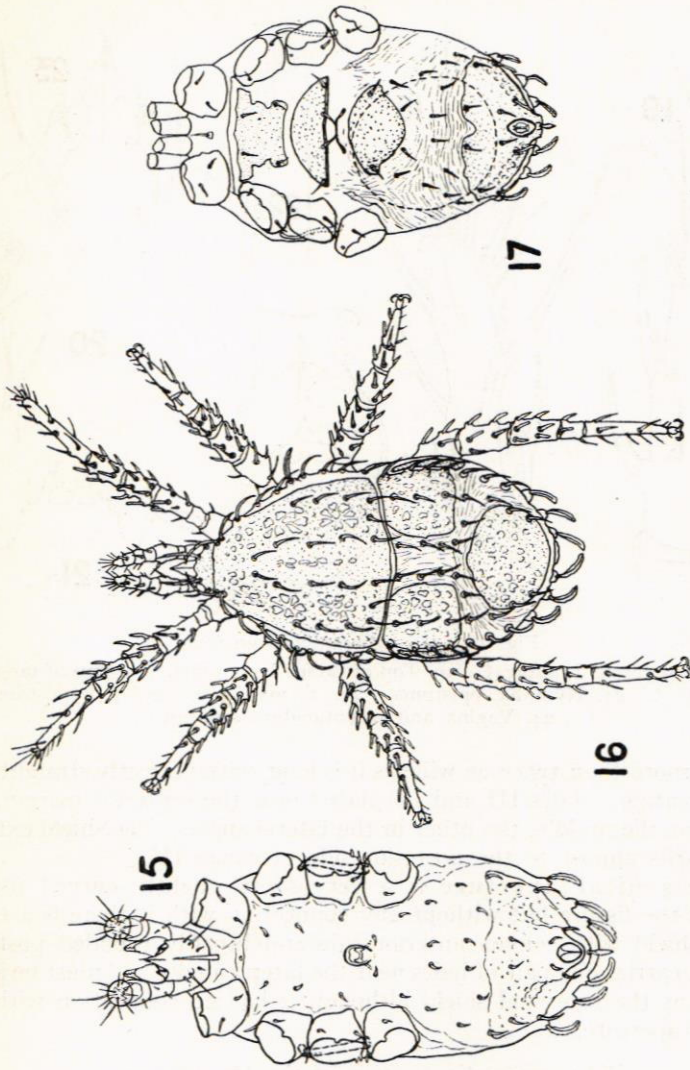


Fig. 15—17. *Microsejus truncicola*.
 15. Male, ventral view. 16. Female, dorsal view. 17. Female, ventral view.

Sternal shields I and II fused to a trapezoidal shield, with straight anterior and slightly concave posterior side, which extends to a level with the posterior side of coxae II; the sides are irregular, with two small incisions, separated by a low round projection. Hairs I close to the anterior margin, as far from one another as from the lateral angles which are cut off obliquely. Hair II inserted near the posterior angles. Sternal shields III and IV coalesced to a large, transverse, semicircular

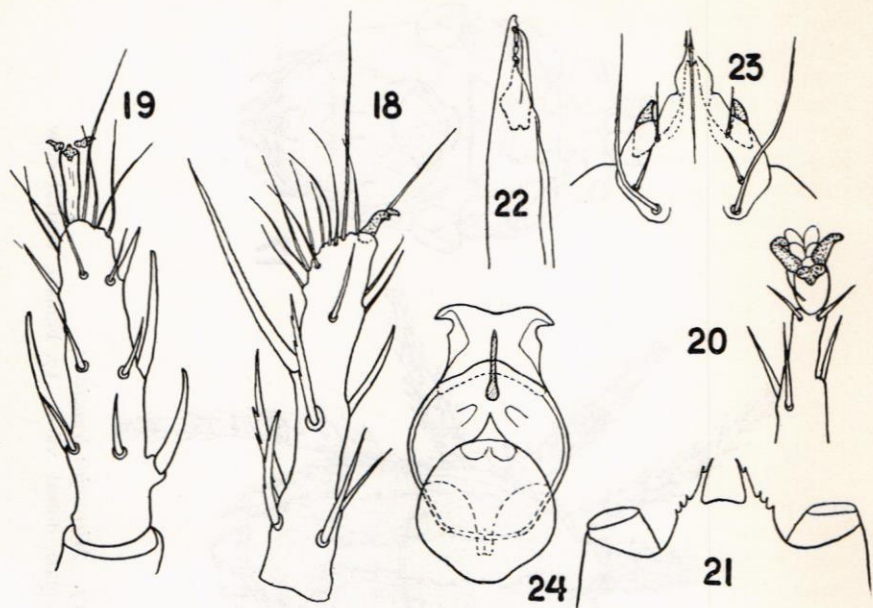


Fig. 18—24. *Microsejus truncicola*.

18. Top of tarsus I, adult ♂. 19. Top of tarsus I, nympha. 20. Top of tarsus II, adult ♂. 21. Nympha, epistoma. 22. ♂, mandible. 23. ♂, hypostoma. 24. Vagina and receptaculum seminis.

shield, more than twice as wide as it is long, with perfectly straight posterior margin. Hairs III and IV placed near the posterior margin, one pair near the middle, the other in the lateral angles. The shield extends backwards almost to the posterior side of coxae III.

The genital aperture is a very short, slightly curved fissure. Behind the fissure but without any connection with it there is a triangular shield with convex anterior side and broadly rounded posterior top. It carries one pair of hairs near the lateral angles and must be interpreted as the epigynial shield although it has no connection with the genital aperture.

The systematic position of the Microgyniina.

The *Microgyniina* are undoubtedly related to the *Sejina*, especially the *Sejidae*. The female genital aperture is in both groups a transverse fissure and in both the sternal shield is divided into at least two shields and there are more than two dorsal shields.

But, on the other hand, the differences are too great to allow that both groups are referred to the same cohorts. In the *Sejidae* the posterior edge of the posterior sternal shield acts as the anterior lip of the large

genital fissure, as the posterior lip of which functions the anterior edge of the large shield which I interpret as the genitiventral shield, the epigynial shield and the ventral shields being either fused or the epigynial shields not being yet differentiated. Both assumptions are strengthened by the fact that in those groups, where the epigynial shield attains the greatest size, as f. i. in the *Uropodina* and the *Trachytina*, it has no hairs, from which it is possible to draw the conclusion that whenever the epigynial shield has one or more pairs of hairs this is due to the fact that it has coalesced with a detached part of the ventral shield, containing a varying number of hairs, for instance four in *Sejus*, three in *Epicrosejus*.

There is no trace of this large shield in the *Microgyiniina*; moreover, the posterior edge of the posterior sternal shield does not take part in the formation of the female genital aperture. The same applies to the shield behind the genital fissure which is very peculiar, having one pair of hairs, for which reason it must be interpreted as homologous to the epigynial shield of the *Gamasides*.

On the whole the *Microgyiniina* may be considered to be derived from the *Sejidae* by a retrogressive development of the genital fissure which led to the detachment both of the posterior sternal shield and of the epigynial shield from the genital aperture. The reason for this remarkable diminishing in size of the genital aperture is, however, quite obscure and it appears the more extraordinary considering the fact that the eggs in both genera are of quite exceptional size.

Furthermore the genital fissure is placed far back in the *Microgyiniina*, between coxae IV in the *Microsejidae* and between coxae III and IV in the *Microgyiniina*, whereas it is placed a little in front of coxae III in the *Sejidae*.

Another feature which distinguishes the *Microgyiniina* from the *Sejidae* is the small size of the male genital aperture, which is, moreover, not closed by an operculum but by a small projection from the ventral shield, without any suture.

The cohorts *Microgyiniina* may be characterized in the following way:

Male genital aperture small, not closed by an operculum, placed far back. Female genital aperture a small, transverse fissure, placed far back, without any connection with either sternal or epigynial shields. Three or four dorsal shields. Peritrema short. Tarsi I without peduncle.

Key to the families.

- Dorsal side covered by three shields. Epigynial shield divided into two shields..... *Fam. Microgyiniidae*
 Dorsal shield covered by four shields. Epigynial shield not divided..... *Fam. Microsejidae.*