CONTRIBUTIONS TOWARDS A REVISION OF *MYRSIDEA* WATERSTON. VII. (PHTHIRAPTERA: AMBLYCERA: MENOPONIDAE)

BY

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By B. K. TANDAN

CONTENTS

SYNOPSIS

This part of a series of papers on *Myrsidea* Waterston deals with the species parasitic on babblers of the genera *Garrulax* and *Pomatorhinus* (subfamily Timaliinae, Aves). It includes a redescription of one known and descriptions of 12 new species, a key to the species, a host-parasite list and a short discussion on host-parasite relationships.

INTRODUCTION

THIS is part VII in the series of papers initiated by Clay (1966). Like the previous part (Tandan & Clay, 1971) this too is devoted to species of *Myrsidea* parasitic on babblers (subfamily Timaliinae of Muscicapidae) and deals with species parasitizing the genera *Garrulax* and *Pomatorhinus*. Although this part was intended exclusively for species parasitizing *Garrulax*, species from *Pomatorhinus* have been included as they were found to resemble closely those occurring on certain species of *Garrulax*. The host-names are according to Deignan in the *Check-List of Birds of the World* (1964), and the names of Provinces of Thailand are also as given in Deignan (1963). The following abbreviations have been used for the collections which are the depositories for the material on which this study is based: BMNH, British Museum (Natural History); USNM, U.S. National Museum; EC, K.C. Emerson collection; REC, Robert E. Elbel collection.

TAXONOMIC CHARACTERS

The characters common to all or most of the species dealt with in this paper are given below. Neither these characters nor the generic characters given by Clay (1966 : 330–332 and 1969) are repeated in the specific descriptions.

1. *Head* of the same general shape (Pl. 1, figs 55–57), differences shown by measurements. Head chaetotaxy basically as in *M. thoracica* (see Clay, 1966, fig. 1), as also the relative proportions of the pair of setae on the last segment of the maxillary palp but in some taxa there may be greater individual variation. End of seta 10 usually reaches to about the middle of seta 11 (Text-fig. 10). Gular setae usually 4 + 4, occasionally 4 + 3 or 4 + 5 and exceptionally 3 + 3, 5 + 5 or 6 + 5. Antenna as in Clay, 1966, fig. 2, and the two sensilla coeloconica (Clay, 1969 : 8, 1970 : 76) on the second segment slightly apart. Hypopharynx variable.

2. *Thorax*. Pronotum with 3 + 3 setae near each antero-lateral corner of which, according to available evidence, the 2 + 2 outer spiniform ones may be propleural setae and the relatively 1 + 1 inner moderately long to long pronotal setae. Posterior margin of pronotum with 3 + 3 long and stout setae. Mesonotum undivided. Metanotum normal or modified with 3 + 3 antero-lateral spiniform and 1 + 1 long postero-lateral setae (not included in setal counts), lying between the latter are a variable number of marginal setae. Metapleural setae spiniform. Metasternal plate triangular in shape with a varying number of setae, its anterior width depending on that of the metanotum but the posterior narrow apex variable in length. One or two of the metasternal setae each side are anterior and more central than the remaining somewhat marginal ones; only in one species was the number of anterior setae over 4 (Text-figs 14, 15). First tibia with 3 + 3 outer ventro-lateral and a varying number of dorso-lateral setae.

3. *Abdomen*. In both sexes spiracles open on the tergites; in the female either IV or V, in the male V, is the broadest tergite. In the female the anterior terga are normal or modified, the extent of modification being reflected by the curvature of the line of marginal setae; the edge of the vulva may be smooth or serrated. Microtrichia of the inner surface of the genital chamber variable in the three species in which they are visible. No structure resembling the complicated bursa copulatrix of forms infesting *Turdoides* (Timaliinae) and Icteridae (Clay, 1968; Tandan & Clay, 1971) surrounds the opening of the spermathecal duct in the genital chamber. The duct either appears to open in a depression at the apex of a papilla (Text-fig. 37), the genital papilla (sensu Kéler, 1971 : 10), with the opening being usually visible, or in a thin-walled sac, without the opening being visible. While the genital papilla may or may not have characteristic pigmentation, the duct proximal to the opening is usually wider and appears to be somewhat hardened. On the other hand, the structurally simpler, thin-walled sac is probably the homologue of the bursa copulatrix as indicated by the presence of concretions in the sac of one species (*orientalis*) resembling those seen inside the bursa of diverse species parasitic on *Turdoides*. Owing to the membranous nature of the duct and sac (or bursa copulatrix), they are not always apparent in all specimens, so that in those species (*patkaiensis* and *macraidoia*) in which one or both these structures have not been seen, they may in fact be present. However, the details of these structures differ in different individuals of the same species (Text-figs 33, 34), due mainly to distortion produced during preparation of the specimen, and as the number of specimens is small, these limitations prevent a satisfactory comparison between populations from different hosts.

The male genitalia have all the basic components composing the external genitalia of *Myrsidea*. These show more specific variation than has been found in recent studies of groups of species from related hosts, in which it is usually only the genital sclerite which shows specific differences. A long and narrow spermatophore closely associated with the genital sclerite has been seen in some species.

Abdominal chaetotaxy. Tergites without anterior setae. Post-spiracular setae III and V always shorter and finer than II and IV, III being slightly longer than V. In the male on tergum IX 1 + 1 (occasionally 3) moderately long to long marginal and 4 + 4, exceptionally 9 or 10, short internal anal setae. Anterior setae absent or present on pleurites II–VII, or some of them. Pleurite VIII has 3 + 3 setae, the central one being very long and stout, but the lengths of the outer and inner ones relative to each other vary; extra inner setae (v) are usually present in the female, rarely in the male (Text-fig. 27). Sternite I without setae. Arrangement of setae on sternites IV–VII in the female, IV–VIII in the male and the genital region in both sexes as in *Myrsidea* from *Trudoides* (see Tandan & Clay, 1971), only the setae in the genital region being much stouter. The outermost setae on the vulval margin stouter than the inner ones.

The following abdominal setae are found in all the species dealt with here: 1 + 1 antero-lateral, spiniform on tergite I; 1 + 1 post-spiraculars on I–VIII and the associated spiniform of the post-spiracular setal complex (Clay, 1970) on II–VIII; in the male usually 1 + 1, occasionally 1 + 2, moderately long to long on posterior margin of IX; 2 + 2 antero-lateral, spiniform or short on sternite II; 1 + 1 postero-lateral on sternite VIII in the male and 2 + 2 in the genital region of both sexes; 3 + 3 laterals on segment IX, the 2 + 2 outer and relatively dorsal ones being probably pleural. These setae have been excluded from the setal counts given in the text, Key and Tables, with the exception of the 1 + 1 postero-lateral setae on sternite VIII in the male and 2 + 2 in the genital region, which may not be readily identifiable when there are numerous setae in this part. The 2 + 2 setae on sternite II, usually separable from other setae by their proportions and antero-lateral position, may not always be separable on one or both sides when the number of setae on this sternite is greater (Text-fig. 29).

A combination of some of the following taxonomic specific characters has been found useful in determining the status of populations from different hosts, the relatively more important ones having been marked with an asterisk (*). 1. Degree of development of hypopharynx*. 2. Form of anterior terga and nature of the vulval margin in the female*. 3. Form of metanotum in the female and shape of metasternal plate. 4. Shape of components of male genitalia, especially the genital sclerite*. 5. Details of the structure associated with the opening of the spermathecal duct*. 6. Number of dorso-lateral setae on tibia I and in the brush on femur III. 7. Number of setae on metanotum and metasternum. 8. Length of setae on pleurite I in the female; presence or absence of anterior setae on pleurites II–VII and the relative proportions of the outer and inner setae on pleurite VIII. 9. Number of setae on tergum IX in the female, on I and of terminal setae on IX in the male. 10. Number and length of setae on tergum I in the female and on VIII in both sexes*. 11. Length of post-spiracular setae III, V and VI. 12. Number of setae on sternite II in both sexes and also III in the female*. 13. Arrangement

of setae on sternites II and III in the female*. 14. Presence or absence of central anterior setae on sternites III or IV–VI. 15. Number of setae in the genital region and on vulval margin*.

SPECIES DESCRIPTIONS

The following species-descriptions and measurements (in millimetres, usually corrected to two decimal places) are on the same lines as those given by Clay (1966, 1968) and the Tables of the sternal chaetotaxy, based on specimens from the type-host only, by Tandan & Clay (1971). Figures in parentheses denote the number of specimens or structures examined or measured, and $\bar{x}$ the mean. The chaetotaxy in the figures agrees with the specimens from which these were drawn and broken or missing setae, shown by broken lines, have been usually completed from the other side of the same specimen or from another specimen.

Myrsidea sehri Ansari, 1951

(Pl. 2, fig. 59; Text-figs 10, 21, 39)

Type-host: *Garrulax l. lineatus* (Vigors).

Myrsidea sehri Ansari, 1951: 177, fig. 19. Holotype ♀, from *Trochalopteron lineatum grisescentior* (Hartert), INDIA (BMNH) [examined].

Only the two specimens comprising the type-material of this species, the first *Myrsidea* to be described from one of the Timaliinae, have been available for study. These are in poor condition with most of the thoracic and abdominal setae missing and it has not been possible to take all the necessary measurements or to determine the size of the taxonomically important setae—post-spiracular, those on tergum VIII and in the female on tergum I. In the male genitalia the parameres are twisted giving the impression of being 'exceptionally reduced' as interpreted by Ansari (1951 : 178), but fortunately the genital sclerite is undamaged. While the genital sclerite distinguishes the male allotype from other species, satisfactory separation of the female holotype, especially from *erythrocephali*, could not be made and must await a good series from the type-host.

♀ and ♂. Hypopharynx considerably reduced. In the female, tergum I unmodified, vulval margin well to strongly serrated along the greater part of its width, microtrichia of genital chamber as in *M. abidae* (see Clay, 1966: fig. 24), but more closely set and slightly longer, and internally a distinctive crown-like sclerite, probably associated with the spermathecal duct (Text-fig. 39). Male genital sclerite distinctive (Pl. 2, fig. 59), apparently no posterior pointed processes. Metasternal plate normal (Text-fig. 21). Metanotal setae: ♀ and ♂, probably 2 + 2. Metapleural setae: ♀, 4 + 3; ♂ probably 2 + 2. Metasternal setae: ♀ and ♂, 3 + 3. Outer dorsal setae of tibia I: ♀ and ♂, 4 + 3. Setae of femoral brush: ♀, 23 + 23 (not 21 as given in the original description); ♂, both femora missing.

ABDOMINAL CHAETOTAXY. Tergal setae: ♀, I, 2 + 2; II, 4 + 6; III, 5 + 6; IV–VI, 7 + 7; VII, 6 + 6; VIII, 4 + ? (three alveoli are visible on this side which has a damaged lateral edge); IX, 2 long. ♂, I, 2 + 2; II, 4 + 4; III, 5 + 5; IV, 6 + 7; V, 7 + 6; VI, 6 + 6; VII, 5 + 5; VIII, 3 + 3; IX, terminal 4. In both sexes, judging from their alveoli, the 2 central setae on tergum I are probably long; the length of those on VIII is not determinable. Pleural setae: anterior setae absent. VIII: ♀ with an extra inner seta on one side; in both sexes inner and outer setae moderately long and equal in length. Sternal setae. ♀. II, probably 8 anterior, all central; 15 marginal; aster 4 + 4; III, anterior absent, 21 marginal; IV, 6 anterior, 28 marginal; V, 7, 26; VI, 8, 23; VII, 12, 12. The marginal setae in both sexes include those of the lateral brushes on III–VII. Anterior setae in lateral brushes: III, 3 + 2; IV, 7 + 10; V, 14 + 14; VI, 11 + 10; VII, 5 + 6. Genital region 6 + 6; vulval marginal 9 (4 + 4 lateral, 1 central). ♂. II, 7 anterior, marginal 13; aster 4 + 3; III, anterior absent, 18 marginal; IV, 3 anterior, 22 marginal; V, VI, 7, 24; VII, 6, 11; VIII, ?. Anterior setae in lateral brushes: III, 0 + 1; IV, 7 + 7; V, VI, 14 + 10; VII, 4 + 3. Genital region, probably 6 or 7 + 5.

Four species, *erythrocephali* (both sexes), *thailandensis* (male not available), *sikkimensis* (female not available) and *singularis* (male only), which like *sehri* have the reduced hypopharynx and lack anterior setae on the pleurites, all have setae on tergum VIII of which the ends do not cross the margin of tergum IX. It can therefore perhaps be presumed (see also discussion under *singularis*, page 385) that the missing setae on tergum VIII of *sehri* are of a length similar to those of these species; this has been assumed for the purposes of the key.

MEASUREMENTS of ♀ holotype and ♂ allotype. *Length*: head, ♀ 0·315; ♂ 0·29. *Breadth*: preocular, ♀ 0·34; ♂ 0·31. Temples, ♀ 0·50; ♂ 0·435. Pronotum, ♀ 0·31; ♂ 0.28. Metanotum, ♀ 0·465; ♂ 0·35. Broadest tergite: ♂ 0·54. Length of post-spiracular setae. ♂, V, 0·128, 0·141.

MATERIAL EXAMINED.

Holotype ♀, allotype ♂ of *Myrsidea sehri* Ansari, 1951 from *Trochalopteron lineatum grisescentior* = *Garrulax l. lineatus* (Vigors), INDIA: Kulu, Panjab, 6.x.1939 (BMNH).

Myrsidea erythrocephali sp. n.

(Pl. 2, fig. 60; Text-figs 1, 2, 33, 34, 43)

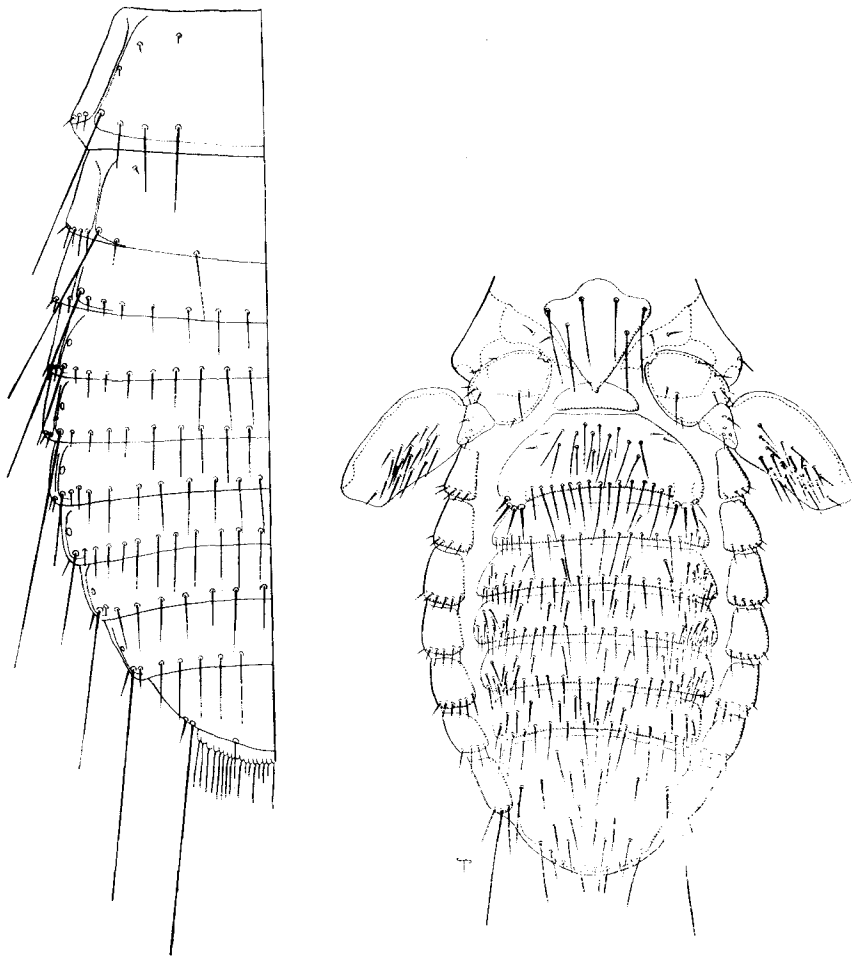
Type-host: *Garrulax erythrocephalus* (Vigors).

This species closely resembles the following two species, *manipurensis* and *duplicata*, being distinguished from them in both sexes by the greatly reduced hypopharynx. Further characters separating the female from that of *manipurensis* are the relative proportions of the two central and two lateral setae on tergum I, and from that of *duplicata* the greater enlargement of tergum I and the details of the chaetotaxy. No characters other than the hypopharynx and the details of the chaetotaxy have been found for separating the male from that of *duplicata*; these characters together with the proportions of the inwardly directed arm of the basal apodeme and the shorter post-spiracular setae V and VI separate the male from that of *manipurensis*.

♀ and ♂. Hypopharynx greatly reduced. In the female, tergum I moderately enlarged and II very slightly modified; vulval margin well serrated medially, smooth at the extreme lateral ends. Spermathecal duct and genital papilla as in Text-figs 33, 34; in 33 the duct is probably compressed, hence the squat shape. In the male genitalia (Text-fig. 43) the parameres are slightly curved and anteriorly narrow, and the inwardly directed arm of the basal apodeme is prominent and tapers posteriorly; genital sclerites (Pl. 2, fig. 60) as in *manipurensis* and *duplicata*. Apex of metasternal plate not produced (Text-fig. 2). Metanotal setae: ♀ 6–8 (7); ♂ 4–5 (8).

Metapleural setae: ♀ 3–4, x̄ 3·19 (16 sides); ♂ 2–3, x̄ 2·12 (16). Metasternal setae: ♀ (8) and ♂ (8), 3 + 3. Outer dorsal setae of tibia I: ♀ (16 tibiae), ♂ (14), 4. Setae of femoral brush: ♀ 18–24, x̄ 19·21 (14 femora); ♂ 16–20, x̄ 18 (16).

ABDOMINAL CHAETOTAXY. Tergal setae: ♀ (Text-fig. 1); I, 2 + 2 (7), the 2 central setae long and longer than the 2 lateral short to moderately long ones; II, 12–15, x̄ 12·80 (5); III, 14—17, x̄ 15·57 (7); IV, 15–19, x̄ 16·85 (7); V, 16–23, x̄ 19·30 (7); VI, 16–20, x̄ 18·33 (6); VII, 15–18, x̄ 17 (6); total of II–VII, 97–106, x̄ 102 (3); VIII, 7–11, x̄ 9·16 (6); IX, 2 (7) moderately long. ♂; I, 2 + 2 (8); II, 7–12, x̄ 10·66 (6); III, 10–14, x̄ 12·33 (6); IV, 12–16, x̄ 14·66 (6); V, 13–17,



FIGS 1–2. *Myrsidea erythrocephali*. 1 (left), ♀ dorsal; 2, ♂ ventral.

x̄ 15·16 (6); VI, 12–17, x̄ 14·50 (6); VII, 11–14, x̄ 12·33 (6); total of II–VII, 65–86, x̄ 79·66 (6); VIII, 6–8, x̄ 6·71 (7); IX, terminal 4 (7). In both sexes the ends of the more central setae on tergum VIII fall well short of the posterior margin of tergum IX. Pleural setae: anterior setae absent. VIII: ♀ usually with an extra inner seta on one or both sides; in both sexes outer and inner setae as in Text-fig. 2. Sternal setae. ♀: II, anterior 10–12 (8), all central; marginal 11–14, x̄ 12·57 (7); total of anterior and marginal 21–25, x̄ 23·57 (7); aster 4–5, x̄ 4·53 (15 asters); III—VII, Tables I, IV; total number on VII, 27–34, x̄ 30·20 (5); genital region 10–14, x̄ 11 (7); vulval marginal, each side 4–6, total 9–11 (7), those of the two sides separated by a wide gap. ♂ (Text-fig. 2): II, anterior 10–14, x̄ 12·30 (7); marginal 12–15, x̄ 13·75 (8); total of anterior and marginal 22–29, x̄ 26 (7); aster 4–5, x̄ 4·06 (16); III–VII or VIII, Tables II, VI; total number on VII, 20–28, x̄ 25 (5); genital region 13–16, x̄ 14·25 (8).

MEASUREMENTS. *Length*: total, ♀ 1·66–1·80, x̄ 1·72 (5); ♂ 1·35–1·49, x̄ 1·44 (6). Head, ♀ 0·30–0·32, x̄ 0·31 (6); ♂ 0·29–0·30, x̄ 0·294 (6). *Breadth*: preocular, ♀ 0·33–0·35, x̄ 0·34 (6); ♂ 0·31–0·32, x̄ 0·313 (6). Temples, ♀ 0·48–0·50, x̄ 0·485 (6); ♂ 0·42–0·45, x̄ 0·44 (6). Pronotum, ♀ 0·29–0·32, x̄ 0·31 (6); ♂ 0·265–0·29, x̄ 0·28 (6). Metanotum, ♀ 0·435–0·48, x̄ 0·45 (6); ♂ 0·35–0·38, x̄ 0·37 (6). Broadest tergite: ♀ 0·61–0·70, x̄ 0·65 (5); ♂ 0·52–0·53, x̄ 0·523 (6). Length of post-spiracular setae: ♀ (10), III 0·128—0·168, x̄ 0·143; V 0·104–0·124, x̄ 0·115; VI 0·153–0·198, x̄ 0·189. ♂ (10), III 0·111–0·131, x̄ 0·122; V 0·094–0·118, x̄ 0·106; VI 0·128–0·205, x̄ 0·158.

MATERIAL EXAMINED.

Holotype ♂, slide no. SE-1861, from *Garrulax erythrocephalus* (Vigors), THAILAND: Doi Inthanon, Chiang Mai Province, 28.xi.1964 (*H. E. McClure*) (USNM).

Paratypes. From *G. erythrocephalus*, THAILAND : 4 ♂, Chiang Mai Province, Doi Inthanon, 26–28.xi.1964 (*H. E. McClure*); 8 ♀, 3 ♂, Doi Pha Hom Pok, 30.x., 31.x., 11.xi.1965; 1 ♀, Chom Thong, 4.ii.1971 (*K. Thonglongya*) (EC).

A male and female, slide no. MAPS 2283, from *Pomatorhinus erythrogenys* Vigors (THAILAND: Doi Pha Hom Pok, Chiang Mai Province, 11.xi.1965 (EC)) show characters somewhat intermediate between *erythrocephali* and *duplicata*, the male genital sclerite being the same as in these species and also *manipurensis*, while the other components of the genitalia and the genital papilla are as in *erythrocephali*. Further specimens must be examined from this host before it is possible to decide whether the population merits an independent taxonomic status or whether it can be included in *erythrocephali* s. l.

Myrsidea manipurensis sp. n.

(Pl. 1, fig. 55; Text-figs 3, 13, 35, 48)

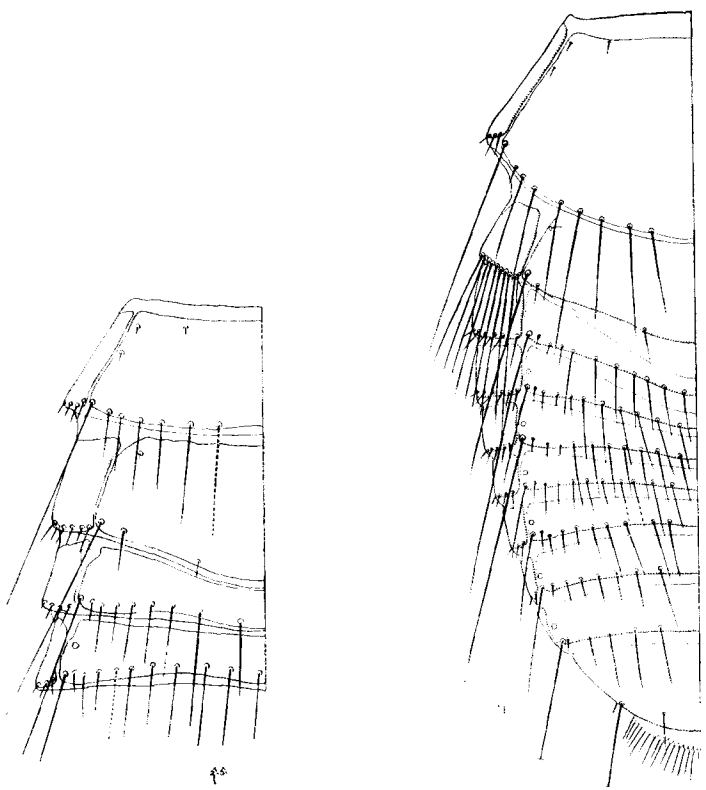
Type-host: *Garrulax squamatus* (Gould).

Characters distinguishing this species from *erythrocephali* and *duplicata* are given under those species and the characters in which this form resembles *erythrocephali* are not repeated here.

♀ and ♂. Hypopharynx fully developed. In the female tergum I considerably enlarged and II slightly modified; vulval margin with median serrated portion somewhat narrower than in *erythrocephali*; genital papilla, on which the spermathecal duct opens, distinctive (Text-fig. 35). Male genitalia similar to those of *erythrocephali*, but the inwardly projecting dorsal arm of the basal apodeme is significantly shorter, the parameres are slightly more curved (Text-fig. 48) and the genital sclerite is somewhat smaller. Apex of metasternal plate very slightly produced

(Text-fig. 13). Metanotal setae: ♀ (2) 10, 11; ♂ 4–5 (6). Metapleural setae: ♀ 3–4, x̄ 3·50 (4 sides); ♂ 2 (8). Outer dorsal setae of tibia I: ♂ 3–4, x̄ 3·87 (8 tibiae). Setae of femoral brush: ♀ 15–18, x̄ 16·25 (4 femora); ♂ 15–17, x̄ 15·87 (8).

ABDOMINAL CHAETOTAXY. Tergal setae: ♀ (2, holotype given first followed by that of the paratype if different) (Text-fig. 3); I, 2 + 2, the 2 central setae fine and short to moderately long and the 2 long outer ones considerably longer and stouter; II, 15, 14; III, 16, 17; IV, 20, 17; V, 23, 21; VI 18, 23; VII, 20, 18; total of II–VII, 112, 110; VIII, 12, 11; IX, 2 long. ♂ (4); I, 2 + 2; II, 10–13, x̄ 11·75; III, 12–14, x̄ 13; IV, 12–15, x̄ 13·25; V, 13–15, x̄ 14·25; VI, 13–16, x̄ 15·50; VII, 13–14, x̄ 13·25; total of II–VII, 75–88, x̄ 81; VIII, 6–9, x̄ 7·25; IX, terminal 4. The ends of the more central setae on tergum VIII fall short of the posterior margin of tergum IX but may just cross it in the male. Pleural setae of VIII: ♀, 1 + 1 extra inner setae (2). Sternal setae. ♀ (2): I, 1; II, anterior 13, 14, all central; marginal 7; aster 5–6, x̄ 5·50 (4 asters); total number on VII, 33, 41; genital region 12, 13; vulval marginal, each side 3–4, total 6–8. ♂ (4): II, anterior 14–18, x̄ 15·75; marginal 11; aster, x̄ 4·12 (8); total number on VII, 22–26,



FIGS 3–4. *Myrsidea* spp., ♀, holotype, dorsal. 3 (left), *M. manipurensis*; 4, *M. singularis*.

x̄ 23·50; genital region 14–16. Compared to *erythrocephali* setae in the femoral brush tend to be fewer and metanotal setae and setae on terga II–VIII tend to be slightly more in number. The female tends to have fewer marginal setae on sternite II, setae in lateral brushes on sternites III–VI (Table IV) and on the vulval margin, but tends to have more setae on sternite VII. The male tends to have more central anterior setae on sternite II and fewer central setae on sternites III–V and slightly less dense brushes of setae on sternites IV–VI (Tables II, VI).

MEASUREMENTS of 2 ♀ (holotype given first, followed by paratype if different) and 4 ♂. *Length* total, ♀ 1·83, 1·64; ♂ 1·44–1·49, x̄ 1·46. Head, ♀ 0·32; ♂ 0·29–0·31, x̄ 0·30. *Breadth*: preocular, ♀ 0·37; ♂ 0·33–0·34, x̄ 0·337. Temples, ♀ 0·53, 0·50; ♂ 0·47–0·48, x̄ 0·474. Pronotum, ♀ 0·33, 0·32; ♂ 0·29–0·30, x̄ 0·297. Metanotum, ♀ 0·52, 0·51; ♂ 0.377–0·389, x̄ 0·381. Broadest tergite: ♀ 0·71, 0·73; ♂ 0·53–0·54, x̄ 0·534. Length of post-spiracular setae: ♀ ,III 0·138, 0·160; V 0·138, 0·146; VI 0·205, 0·237. ♂, III 0·123–0·135, x̄ 0·130 (7); V 0·106–0·133, x̄ 0·123 (8); VI 0·202–0·242, x̄ 0·223 (8). These, especially V and VI, tend to be longer than in *erythrocephali* and *duplicata*.

MATERIAL EXAMINED.

Holotype ♀, slide no. 19879*a*, from *Garrulax squamatus* (Gould), INDIA: Kangpokpi, Manipur, Assam State, 29.i.1952 (*R. Meinertzhagen*) (BMNH).

Paratypes. 1♀, 4♂, with data as given for holotype.

Myrsidea duplicata sp. n.

(Text-figs 36, 37)

Type-host: *Pomatorhinus schisticeps* Hodgson.

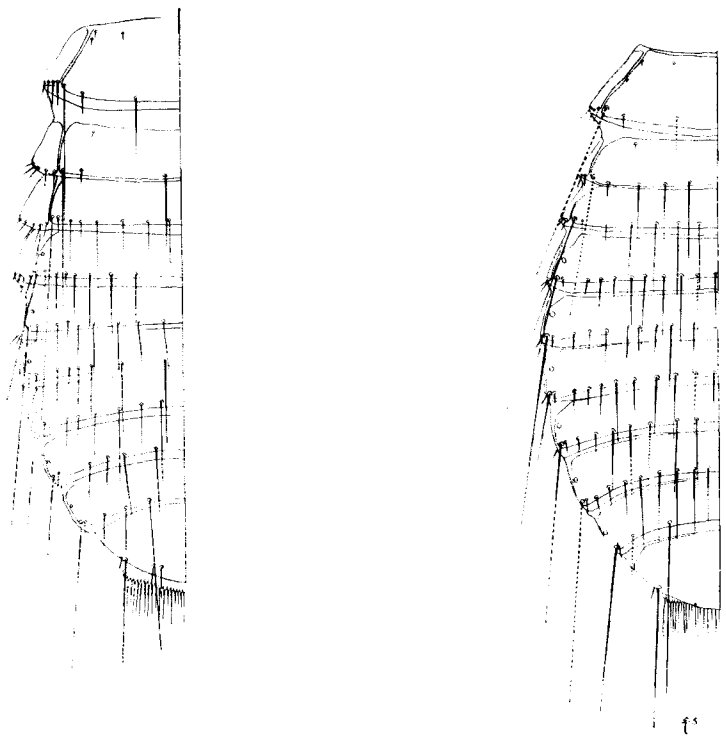
This species resembles most closely *erythrocephali* and *manipurensis*, especially the latter in the character of the fully developed hypopharynx. It is slightly smaller than *manipurensis* and distinguished in the female by the form of terga I and II and the relative proportions of the 2 central and 2 lateral setae on tergum I; but no character other than the proportions of the inwardly directed arm of the basal apodeme has been found for separating the two available males. Characters which separate it from *erythrocephali* are given under that species and those in which it resembles *manipurensis* (and *erythrocephali*) have been generally omitted from the description.

♀ and ♂. Hypopharynx fully developed. In the female tergum I very slightly but perceptibly enlarged and II normal. Serrations of vulval margin and the metasternal plate in both sexes as in *erythrocephali*. Genital papilla on which the spermathecal duct opens as in Text-figs 36, 37, the presence of a depression around the opening of the duct being suggested by the specimen shown in Text-fig. 37. Male genitalia mainly as in *erythrocephali*, the genital sclerite as in *erythrocephali* and *manipurensis* but in the available material appears to differ somewhat in proportions. Metanotal setae: ♀ 9–10 (4); ♂ (2) 5, 6. Metapleural setae: ♀ 2–3, x̄ 2·75 (8 sides). Metasternal setae: ♀ 6–7 (4). Outer dorsal setae of tibia I: ♀ 3–5, x̄ 4 (8 tibiae); ♂ 4 (3). Setae of femoral brush: ♀ 13–16, x̄ 14·43 (7 femora); ♂ 13–15, x̄ 14 (4); these tend to be fewer than in *manipurensis* and *erythrocephali*.

ABDOMINAL CHAETOTAXY. Tergal setae: ♀; I, 2 + 2 (1), 2 + 3 (3) due to an additional seta on one side only between the central and lateral tergal setae and of which the position is not constant; on I the 2 central setae long and longer than the moderately long outer setae (the latter are slightly longer than in *erythrocephali*); total of II–VII, 87, 90 (2); VIII, 8–9, x̄ 8·66 (3); IX, 2 moderately long. ♂ (2); I, 2 + 2; total of II–VII, 69, 76; VIII, 6; IX, terminal 4, 5.

In the female both range and mean of the total number of setae on II–VII is less than in *manipurensis* and *erythrocephali*; in the male only the mean is less. Pleural setae of VIII: ♀, 1 + 1 extra inner setae (4). Sternal setae. Compared to *manipurensis* the female has fewer anterior setae on sternite II (anterior 6–8, all central, marginal 6–9, total of anterior and marginal 13–15 (4), markedly fewer central anterior setae and somewhat fewer setae in the lateral brushes on sternites IV–VII and in the genital region (9–11 (4)), but the vulval marginal setae (each side 4–6, total 8–11, x̄ 9 (4)) tend to be slightly more. The male also has fewer anterior setae on sternites II (anterior 10, 11, marginal 9 (2)) and IV–VIII, due to their absence on IV and their smaller number on other sternites, as also in the genital region (5 + 5, 7 + 7). The asters also have fewer setae (♀ 3–4, x̄ 3·62 (8 asters); ♂ 3 + 3 (2)).

Measurements of 4♀ and 2♂. *Length*: total, ♀ 1·51–1·61, x̄ 1·58; ♂ 1·26, 1·38. Head, ♀ 0·30–0·31, x̄ 0·306; ♂ 0·288, 0·30. *Breadth*: preocular, ♀ 0·32–0·34, x̄ 0·33; ♂ 0·306, 0·312. Temples, ♀ 0·47–0·49, x̄ 0·48; ♂ 0·43, 0·44. Pronotum, ♀ 0·30–0·31, x̄ 0·306; ♂ 0·276, 0·282. Metanotum, ♀ 0·435–0·49, x̄ 0·46; ♂ 0·347, 0·353. Broadest tergite: ♀, 0·63–0·70, x̄ 0·65; ♂ 0·48. Length of post-spiracular setae: ♀, III 0·123–0·148, x̄ 0·132 (8); V 0·123–0·143, x̄ 0·134 (7); VI 0·188–0·222, x̄ 0·207 (7). ♂, III 0·109–0·123, x̄ 0·114 (3); V 0·111–0·123, x̄ 0·114 (4); VI 0·173–0·202, x̄ 0·184 (4).



Figs 5–6. *Myrsidea* spp., ♀, from type-host, dorsal. 5 (left), *M. assamensis*; 6, *M. orientalis*.

Material examined.

Holotype ♀, slide no. SE-1881*a*, from *Pomatorhinus schisticeps* Hodgson, Thailand: Doi Pui, Chiang Mai Province, 11.ii.1965 (*H. E. McClure*) (USNM).

Paratypes 3♀, 2♂, with data as given for holotype (EC).

Specimens from *Pomatorhinus ferruginosus* resemble *duplicata* in the form of terga I and II, the relative proportions of the central and lateral setae on tergum I, the serrated portion of the vulval margin, the genital papilla and the opening of the spermathecal duct (Text-fig. 38), and the male genitalia with the exception of one component. The inwardly directed arm of the basal apodeme whilst intermediate between that of *duplicata* and *manipurensis* approximates that of the former species. The general chaetotaxy also agrees closely with that of *duplicata* but there are more sternal setae in both sexes; as in *manipurensis* there are central anterior setae on sternites IV and V in the male. However, as the series on which *duplicata* is based is small and the specimens from *P. ferruginosus* also few and not in good condition, their taxonomic position can be decided only after a comparative study of more specimens. The data of these specimens, which are excluded from the type-series of *duplicata*, are as follows:

From *Pomatorhinus ferruginosus* Blyth, Thailand: Dai Pha Hom Pok, Chiang Mai Province, 2♀, 2♂, 28.x., 16.xi.1965 (EC).

Myrsidea thailandensis sp. n.

Type-host: *Garrulax merulinus* Blyth.

The combination of characters possessed by the single female from *G. merulinus* is striking and separates it readily from the females of all other species dealt with here. It is distinguished from *manipurensis* by the reduced hypopharynx, and from all those in which the hypopharynx is reduced either by the number (2 + 2) of setae on tergum I alone or in combination with the relative proportions of the two central and two lateral setae on this tergum. The characters of the female indicate it to be closest to *erythrocephali*, *manipurensis* and *duplicata*, but in the absence of the male, of which the genital sclerite is usually a more reliable guide to relationships, the precise position of this species is indeterminable.

♀. Hypopharynx considerably reduced; tergum I considerably enlarged, II slightly modified; metasternal plate and vulval margin similar to those of *erythrocephali*. Details of genital papilla are not clear due to distortion, but it seems to be either as in *duplicata* or *erythrocephali*. Metanotal setae 8; metapleural setae 3 + 4; metasternal setae 3 + 3; outer dorsal setae of tibia I 4 + 5; setae of femoral brush 18 + 19.

Abdominal Chaetotaxy. Tergal setae: I, 2 + 2 as in *manipurensis* (Text-fig. 3) but the lateral setae are slightly shorter; II–VII, total 104; VIII, 11, the tips of the more central ones falling short of the posterior margin of tergum IX; IX, 2 moderately long. Pleural setae: anterior setae absent. VIII, 2 + 1 extra inner setae (that on left-hand side resembling the adjoining inner seta), the inner and outer setae as in *erythrocephali*. Sternal setae. II, anterior 9, all central (smaller number than in *manipurensis*); marginal 7; aster 6 + 5 (as in *manipurensis*); genital region 7 + 5; vulval marginal 4 + 5. The number of setae on sternites III–V approximately as in *manipurensis* but differs slightly on VI and VII: central anterior and marginal setae respectively on VI, 11 and 12, on VII, 10 and 12. Anterior setae in lateral brushes on IV–VII also slightly more than in *manipurensis*.

MEASUREMENTS of the ♀ holotype. *Length*: total 1·72; head 0·29. *Breadth*: preocular 0·33; temples 0·49; pronotum 0·29; metanotum 0·50; tergite V, 0·65. Length of post-spiracular setae: III 0·094, 0·121; V 0·109, 0·114; VI 0·207–0·222.

MATERIAL EXAMINED.

Holotype ♀, slide no. MAPS-1187, from *Garrulax merulinus* Blyth, THAILAND Doi Pha Hom Phok, Chiang Mai Province, 20.x.1965 (USNM).

Myrsidea sikkimensis sp. n.

(Pl. 2, fig. 61; Text-figs 11, 19, 51)

Type-host: *Garrulax striatus sikkimensis* (Ticehurst).

The two males on which this description is based are readily separable by the genital sclerite, the characters of the hypopharynx and chaetotaxy from other *Myrsidea* males described here.

♂. Hypopharynx considerably reduced. Head seta 10 extends well beyond the middle of seta 11 and is relatively longer than in most species (Text-fig. 11). In the genitalia, of which the genital sac is everted, the parameres are curved posteriorly and of characteristic shape anteriorly, as is the inwardly directed arm of the basal apodeme (Text-fig. 51); genital sclerite also distinctive, apparently without posterior processes as are found in *erythrocephali*. Metasternal plate similar to that of *bhutanensis*.

The chaetotaxy and measurements of the holotype are given first, followed by that of the paratype where the two differ.

Metanotal setae 2 + 2; metapleural setae 2 + 2, 3 + 2; metasternal setae 7, 5; outer dorsal setae of tibia I 4 + 4; setae of femoral brush 17 + 16, 18 + 18.

ABDOMINAL CHAETOTAXY. Tergal setae: I, 2 + 2; II, 11, 6 ?; III, 12, 11; IV, 15, 12; V, 14, 13; VI, 10; VII, 11, 9; total of II–VII, 73, 71; VIII, 6, 5, the tips of the central setae either fall slightly short of or just reach to the posterior margin of tergum IX (Text-fig. 19); IX, terminal 4. Pleural setae: anterior setae absent; proportions of outer and inner setae on pleurite VIII as in *erythrocephali*, only the outer one may also be slightly shorter. Sternal setae: I, 0, 1; II, anterior 19, 13; marginal 14, 11; aster 4 + 5, 4 + 4. Central and marginal setae on the sternites as follows: central anterior; III–VI, absent; VII, 4, 6; VIII, 1, 3. Central marginal: III, 12, 9; IV, V, 11, 13; VI, 11; VII, 8, 6; VIII, 6, 5. Total of anterior and marginal setae: VII, 12; VIII, 7, 8. Setae in lateral sternal brushes on III–VII, Table VI. Total number on VII, 23, 21. Setae in genital region 7 + 10, 7 + 8.

MEASUREMENTS of holotype and paratype. *Length*: total 1·64, 1·61; head 0·324, 0·318. *Breadth*: preocular 0·365, 0·38; temples 0·51; pronotum 0·34, 0·33; metanotum 0·45, 0·44; broadest tergite 0·60, 0·58. Length of post-spiracular setae: III 0·136–0·168, $\bar{x}$ 0·151 (4); V, 0·114–0·136, $\bar{x}$ 0·128 (3); VI 0·185–0·222, $\bar{x}$ 0·206 (4).

MATERIAL EXAMINED.

Holotype ♂, slide no. 19942*a*, from *Garrulax striatus sikkimensis* (Ticehurst), SIKKIM: Chungtang, 16.ii.1952 (*R. Meinertzhagen*) (BMNH).

Paratype. 1♂, with data as given for holotype.

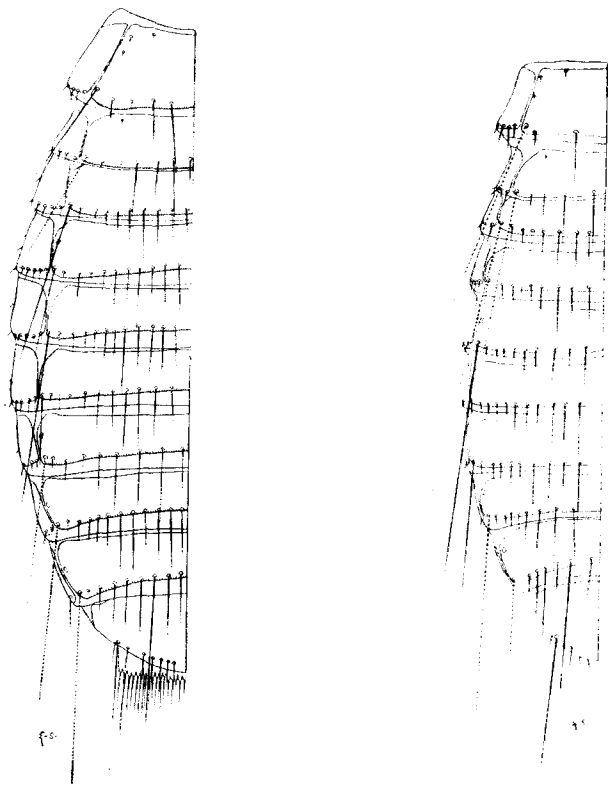
Myrsidea singularis sp. n.

(Pl. 1, fig. 56; Text-figs 4, 12, 14, 17, 32, 45, 53)

Type-host: *Garrulax s. subunicolor* (Blyth).

The female of this species is at once distinguished from all others dealt with here by the enlarged metanotum and the 9–11 long to very long setae on pleurite I, which form a characteristic dorsal frill, and in the male by the details of the chaetotaxy and the genital sclerite.

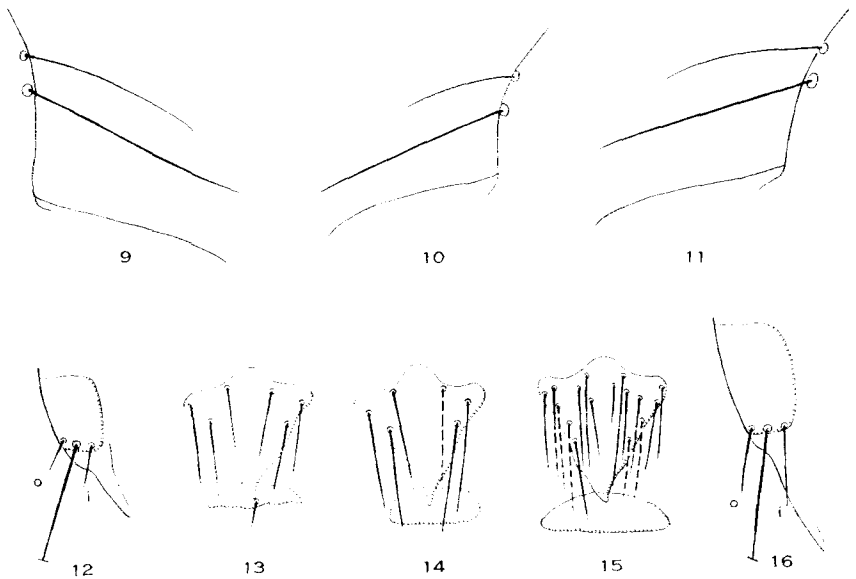
♀ and ♂. Hypopharynx greatly reduced. In the female the metanotum and tergum I are considerably enlarged and terga II–IV are modified. This is the only species among those described here in which the metanotum in the female is wider than the broadest abdominal tergite (Text-fig. 4), consequently the shape of the female body is distinctive. Vulval margin strongly serrated, except for the extreme lateral edges. Microtrichia of genital chamber somewhat as in *M. antiqua* Ansari (see Clay, 1966: fig. 23) but individual combs are wider across and have slightly shorter microtrichia. Spermathecal duct and genital papilla apparent in only two females, in one (Text-fig. 32) their position as in other species, in the other these structures are reversed, presumably by distortion. In the male genitalia (Text-fig. 45) the parameres are rather



FIGS 7–8. *Myrsidea macraidoia*, from type-host, dorsal. 7 (left), ♀; 8, ♂.

straight, anteriorly rounded and the inwardly directed arm of the basal apodeme is long and does not taper posteriorly. Male genital sclerite and the two posterior processes distinctive (Text-fig. 53). Apex of metasternal plate normal or slightly produced (Text-fig. 14). Metanotal setae: ♀ 16–19, x̄ 17·60 (5), this being the greatest number among the forms dealt with here; ♂ 8–9 (4). Metapleural setae: ♀ 3–4, x̄ 3·70 (10 sides); ♂ 2 (8). Metasternal setae: ♀ 7–8 (5); ♂ 3 + 3 (4). Outer dorsal setae of tibia I: ♀ and ♂, 3–5, x̄, ♀ 4·10 (10 tibiae), ♂ 4·25 (8). Setae of femoral brush: ♀ 14–18, x̄ 15·80 (10 femora); ♂ 13–15, x̄ 14 (8).

Abdominal Chaetotaxy. Tergal setae (Text-figs 4, 17): ♀ (5); I, 2 + 2 and one specimen with 4 + 2, the 2 central setae normally short to moderately long and finer than the outer setae, but the five specimens show some variation in size and length of these setae; II, 18–20, x̄ 18·80; III, 18–21, x̄ 19·40; IV, 17–21, x̄ 18·80; V, 15–20, x̄ 16·20; VI, 15–19, x̄ 17·20; VII, 12–17, x̄ 13·75 (4); total of II–VII, 98–113, x̄ 104 (4); VIII, 8–9, x̄ 8·20; IX, 2 long. ♂ (4); I, 6–7, x̄ 6·25; II, 12–16, x̄ 13·25; III, 12–15, x̄ 13·50; IV, 11–14, x̄ 13; V, 11–15, x̄ 13; VI, 11–13, x̄ 12; VII, 9–11, x̄ 10·50; total of II–VII, 70–82, x̄ 75·25; VIII, 5–6, x̄ 5·75; IX, terminal 4. The tips of the two central setae on tergum VIII fall a little or much short of the posterior margin of tergum IX in the female and may reach or just cross it in the male. Pleural setae: ♀; anterior setae present on pleurites III or IV–VII; III, 0–3; IV, 2–4; V, 1–5; VI, 1–4; VII, 1–2. Marginal setae: I, 10–12, x̄ 10·60 (10 sides), of these the innermost is spiniform and moderately long, the rest (9–11) are long to very long, forming a characteristic dorsal frill; VIII, 1–2 short, extra inner setae each side. ♂; pleurites III–VII without anterior setae. Marginal setae: I, 4–5 (8), of normal size. In both sexes the relative proportions of outer and inner setae on pleurite VIII as in Text-fig. 12.



Figs 9–16. *Myrsidea* species. 9–11, head setae 10 and 11. 9, *macraidoia* ♀ from *G. albogularis whistleri*. 10, *sehri* Ansari, ♀, holotype. 11, *sikkimensis* ♂. 12, 16, pleurite VIII, inner (i), outer (o) setae, ♂. 12, *singularis*, 16, *macraidoia* from type-host. 13–15, metasternal plate, ♂ 13, *manipurensis*. 14, *singularis*. 15, *orientalis* from type-host.

Sternal setae. ♀ (5): II, anterior 13–18, x̄ 15·20, all central; marginal 14–17, x̄ 16·40; total of anterior and marginal 29–35; aster 2–5, x̄ 3·70 (10 asters); III–VII, Tables I, IV; total number on VII, 37–45, x̄ 40·80; genital region 14–20, x̄ 17·60; vulval marginal, each side 4–5, total 8–10, those of the two sides separated by a wide gap. ♂ (4): II, anterior 18–21, x̄ 20; marginal 14–16, x̄ 15·25; total of anterior and marginal 33–37; aster 2–3, x̄ 3·12 (8); III–VII or VIII, Tables II, VI; total number on VII, 27–34, x̄ 30·25; genital region 13–15.

Measurements of 5♀ and 4♂. *Length*: total, ♀ 1·73–1·84, x̄ 1·79; ♂ 1·47–1·51, x̄ 1·48. Head, ♀ 0·30–0·312, x̄ 0·309; ♂ 0·288–0·294, x̄ 0·291. *Breadth*: preocular, ♀ 0·35–0·365, x̄ 0·358; ♂ 0·32–0·33, x̄ 0·327. Temples, ♀ 0·52–0·53, x̄ 0·524; ♂ 0·465–0·47, x̄ 0·467. Pronotum, ♀ 0·34–0·35, x̄ 0·346; ♂ 0·318–0·324, x̄ 0·321. Metanotum, ♀ 0·63–0·665, x̄ 0·65; ♂ 0·435–0·45, x̄ 0·44. Bradest tergite: ♀ 0·60–0·62, x̄ 0·613; ♂ 0·535–0·55, x̄ 0·54. Length of post-spiracular setae: ♀, III 0·185–0·247, x̄ 0·204 (7); V 0·133–0·158, x̄ 0·143 (7); VI 0·138–0·168, x̄ 0·152 (9); VII 0·148–0·178, x̄ 0·165 (8). ♂, III 0·160–0·183, x̄ 0·172 (7); V 0·116–0·141, x̄ 0·126 (8); VI 0·131–0·165, x̄ 0·145 (7); VII 0·148–0·190, x̄ 0·172 (6). Post-spiracular III longer than VI (in the female than VII also), this being the only species in which III is longer than VII.

This is an interesting species; attention has already been drawn to some of its unusual features, others are discussed below:– Those species (*sehri*, *erythrocephali*, *manipurensis* and *duplicata*) which normally have 2 + 2 setae on tergum I in the female also have the same number in the male. In this form, however, while the female normally has 2 + 2 setae on tergum I, the male has an additional seta each side between the central seta and that mediad to the post-spiracular seta, this seta being identical in proportions to the two central setae. This is the only species here described exhibiting sexual dimorphism in the number of setae on tergum I. The other difference in the chaetotaxy of tergum I of the two sexes—the proportions of the two central and two lateral setae—is also shown by *manipurensis*. The presence of two very long setae on tergum VIII in both sexes, which extend greatly beyond the posterior margin of tergum IX, is associated with anterior setae on the pleurites in both sexes of *bhutanensis*, *assamensis*, *orientalis* and *macraidoia*. The reverse, the absence of very long setae on tergum VIII associated with the absence of anterior pleural setae, is found in both sexes of *erythrocephali*, *manipurensis* and *duplicata*, the female of *thailandensis* and the male of *sikkimensis*. This arrangement also occurs in male *singularis*, but the female is exceptional in having anterior pleural setae without at the same time having two very long setae on tergum VIII.

Material examined.

Holotype ♀, slide no. 19938, from *Garrulax s. subunicolor* (Blyth), Sikkim: Chungtang, 16.ii.1952 (*R. Meinertzhagen*) (BMNH).

Paratypes. 4♀, 4♂, from *G. s. subunicolor*, Sikkim: Lachen, 26.ii.1952 (*R. Meinertzhagen*, 20023) (BMNH).

Myrsidea bhutanensis sp. n.

(Pl. 2, fig. 62; Text-figs 18, 22, 46)

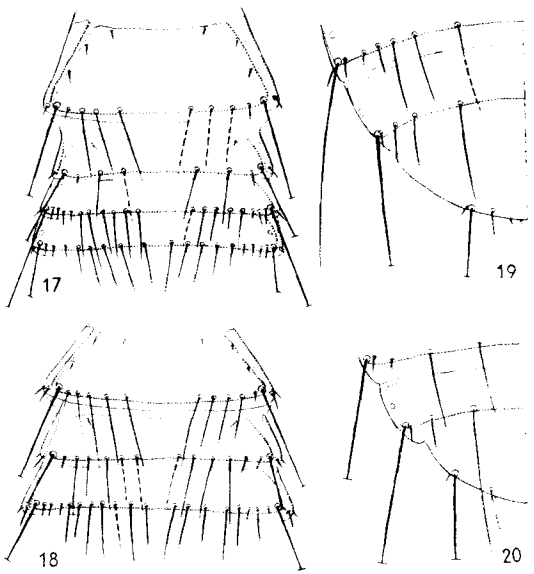
Type-host: *Garrulax ruficollis* (Jardine & Selby).

This form is distinguished from the other species with a fully developed hypopharynx by the form and chaetotaxy of tergum I (*manipurensis*) or by details of the

chaetotaxy (*duplicata* and *patkaiensis*) in the female, by the chaetotaxy and the genital sclerite in the male.

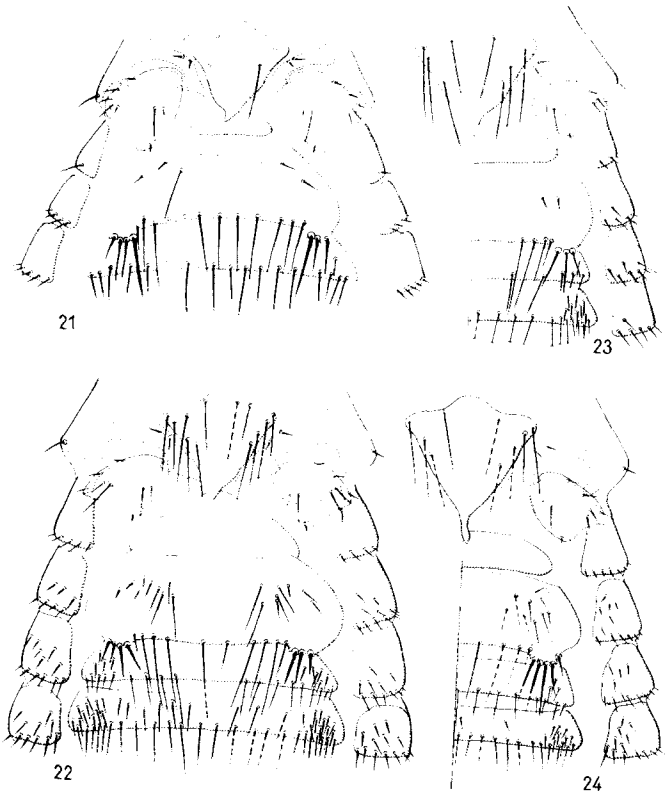
♀ and ♂. Hypopharynx fully developed. In the female tergum I very slightly enlarged and II normal; vulval margin moderately serrated both medially and laterally; only in one specimen is the opening of the spermathecal duct visible and therefore presumably the duct opens on a genital papilla (see page 372). In the male genitalia (Text-fig. 46) the parameres are of characteristic shape due to a rather abrupt narrowing of the outer margin, but anteriorly somewhat as in *erythrocephali*, the inwardly directed arm of the basal apodeme as in *orientalis* and margin of the endomeral plate unlike all other species except *monilegeri*. Genital sclerite distinctive, no posterior pointed processes apparent. Apical portion of metasternal plate in the female as in Text-fig. 22, in the male similar to that of *singularis*. Metanotal setae: ♀ 11–14, x̄ 12·66 (3); ♂ 8–10 (4). Metapleural setae: ♀ 4–5, x̄ 4·33 (6 sides); ♂ 2–4, x̄ 3·25 (8). Metasternal setae: ♀ 12–14 (3); ♂ 9–12, x̄ 10·25 (4). Outer dorsal setae of tibia I: ♀ and ♂, 5–6, x̄, ♀ 5·16 (6 tibiae), ♂ 5·25 (8). Setae of femoral brush: ♀ 27–35, x̄ 31·66 (6 femora); ♂ 23–33, x̄ 27·43 (7).

Abdominal Chaetotaxy. Tergal setae: ♀; I, 12–13, x̄ 12·66 (3); II, 20–23, x̄ 21·33 (3); III, 21–22, x̄ 21·33 (3); IV, 19–21, x̄ 20·33 (3); V, 20 (2); VI, 18, 21 (2); VII, 15, 16 (2); total of II–VII, 115, 120 (2); VIII, 9–10, x 9·33 (3) of which 1–2 are very long extending well beyond the posterior margin of tergum IX; IX, 2–5 short to long, x̄ 3·66 (3). ♂; I, 9–13, x̄ 11·25 (4); II, 13, 18 (2); III, 15–20, x̄ 17·25 (4); IV, 16–19, x̄ 17·25 (4); V, 15–17, x̄ 16 (3); VI, 15–19, x̄ 16·66 (3); VII, 15–17, x̄ 15·66 (3); total of II–VII, 90, 100 (2); VIII, 8–9, x̄ 8·25 (4), of the two central setae which are unbroken (6) five are very long extending well beyond the posterior margin of tergum



Figs 17–20. *Myrsidea* species, ♂ dorsal. 17, 18, metathorax and anterior abdominal segments. 17, *singularis*. 18, *bhutanensis*. 19, 20, terminal segments of abdomen. 19, *sikkimensis*. 20, *patkaiensis* from type-host.

IX and one not reaching this margin; IX, terminal 5 (4). Pleural setae: anterior setae present on pleurites II–VII in the female and in the male always on IV and V, usually on II, III and VI, and occasionally on VII. VIII: ♀, 0–1 extra inner setae each side; proportions of outer and inner setae in both sexes approximately as in *erythrocephali*. Sternal setae. ♀: II, anterior 3 or 4 + 5, 2 + 2, 7 + 7, laterally on the sternite, those of the two sides being separated by a large gap (the arrangement being similar to that in female of *assamensis*); marginal 9–10, arranged characteristically as follows: 1–2 centrally and 4–5 laterally, a gap separating the central from lateral setae (Text-fig. 22); total of anterior and marginal 14–24, x̄ 18·66 (3); aster 3–4, x̄ 3·66 (6 asters). Central and marginal setae on sternites III–VII as follows (1–3): central anterior; III, absent; IV, 9; V, 10, 9; VI, 11, 10; VII, 9, 12. Central marginal: III, 6–8 (3); IV, 10, 11; V, 12 (2); VI, 11, 9; VII, 8, 7. Total of anterior and marginal setae: IV, 20 (1); V, 22, 21; VI,



Figs 21–24. *Myrsidea* species, metathorax and anterior abdominal segments, ventral. 21, *sehri* Ansari, ♂, allotype. 22, *bhutanensis* ♀. 23, *patkaiensis*, ♀, from type-host. 24, *assamensis*, ♀, from type-host.

22, 19; VII, 17, 19. Sternal brushes, Table IV. Total number on VII, 34, 32. Genital region 15–17 (3); vulval marginal, each side 6–7, total 13, those of the two sides separated by a narrow gap. On III the central marginal setae are arranged characteristically, 3–4 each side, separated by a gap (as in *patkaiensis*). ♂ (4): II, anterior 23–29, x̄ 25·50; marginal 15–17, x̄ 15·75; total of anterior and marginal 38–44; aster 4 + 4; III–VII or VIII, Tables II, VI; unlike the previous species central anterior setae are normally present on sternite III; total number on VII, 33–39, x̄ 35 (3); genital region 14–26, x̄ 20·25.

MEASUREMENTS of 3♀ and 4♂. *Length*: total, ♀ 1·70–1·90, x̄ 1·83; ♂ 1·55–1·67, x̄ 1·61. Head, ♀ 0·32–0·335, x̄ 0·326; ♂ 0·29–0·32, x̄ 0·306. *Breadth*: preocular, ♀ 0·34–0·36, x̄ 0·35; ♂ 0·315–0·33, x̄ 0·32. Temples, ♀ 0·50–0·535, x̄ 0·52; ♂ 0·435–0·49, x̄ 0·47. Pronotum, ♀ 0·32–0·35, x̄ 0·338; ♂ 0·28–0·32, x̄ 0·30. Metanotum, ♀ 0·48–0·51, x̄ 0·50; ♂ 0·36–0·42, x̄ 0·39. Broadest tergite: ♀ 0·665–0·73, x̄ 0·70; ♂ 0·52–0·61, x̄ 0·57. Length of post-spiracular setae: ♀, III 0·210–0·260, x̄ 0·242 (5); V 0·148–0·175, x̄ 0·160 (5); VI 0·247–0·272, x̄ 0·260 (5). ♂, III 0·190–0·222, x̄ 0·202 (8); V 0·143–0·158, x̄ 0·151 (7); VI, 0·217–0·311, x̄ 0·258 (8). These are longer than in *duplicata* and *manipurensis*.

MATERIAL EXAMINED.

Holotype ♀, slide no. 19847*a*, from *Garrulax ruficollis* (Jardine & Selby), INDIA: Kangpokpi, Manipur, Assam State, 26.i.1952 (*R. Meinertzhagen*) (BMNH).

Paratypes. 1♀, 2♂, with data as given for holotype (BMNH); 1♀, 2♂ from *G. ruficollis*, BHUTAN: Somchi, 25.xi.1968 (EC).

Myrsidea monilegeri sp. n.

(Text-figs 26, 28, 50, 52)

Type-host: *Garrulax monileger fuscatus* Baker.

Known only from the male, the genital sclerite distinguishes this sex from that of *assamensis* and other species parasitic on *Garrulax* in which the hypopharynx is reduced and anterior setae are present on the pleurites.

♂. Hypopharynx considerably reduced. Male genitalia as shown in Text-fig. 50; genital sclerite (Text-fig. 52) somewhat twisted yet it is unmistakably distinctive. Due to non-availability of other males it could not be confirmed whether the disinctive shape of the endomeral plate is real or caused by the slight outward pulling of the genital sac, and whether the relatively smaller size and anteriorly broader shape of the parameres are real or artefacts due to their being curved in the vertical plane. Metasternal plate is in *erythrocephali*. Metanotal and metapleural setae 2 + 2; metasternal setae 3 + 3; outer dorsal setae of tibia I 5 + 5; setae of femoral brush 29 + 26.

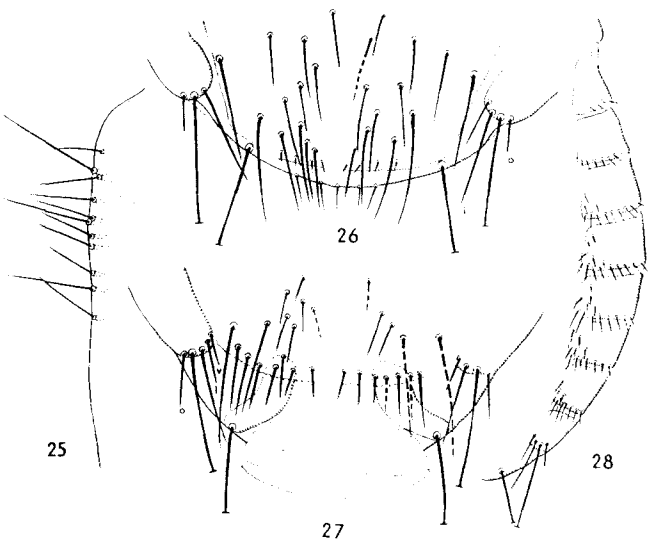
ABDOMINAL CHAETOTAXY. Tergal setae: I, 7; II, VII, 11; III, V, 13; IV, VI, 12; VIII, 4 + 3, the two central setae are very long and their ends extend greatly beyond the posterior margin of tergum IX; IX, terminal 5. Pleural setae: anterior setae present on pleurites III–VI (Text-fig. 28) and their number (III, 4 + 3; IV, VI, 4 + 5; V, 3 + 5; VII, 2 + 3) is distinctly greater than in *assamensis*. VIII, 0 + 1 extra inner seta; outer and inner setae as in Text-fig 26.. Sternal setae. II, anterior 27; marginal 20; aster 5 + 5. Central setae on sternites: III, anterior absent, marginal 15; IV, anterior 10, marginal 12; V, 11, 11; VI, 9, 11; VII, 9, 9; VIII, 2, 5. Setae in lateral brushes: III, anterior 4 and marginal 5 on one side +3 and 3 respectively on other side; IV, 15, 7 + 12, 7; V, 15, 7 + 15, 8; VI, 13, 6 + 14, 6; VII, 6, 3 + 6, 3; VIII, 0, 1 + 0, 1. Total number on VII, 36; genital region 8 – 7.

MEASUREMENTS of the ♂ holotype. *Length*: total 1·59; head 0·32. *Breadth*: preocular 0·33; temples 0·48; pronotum 0·32; metanotum 0·42; tergite V 0·65. Length of post-spiracular setae: III 0·235, 0·260; V 0·138, 0·180; VI, 0·335, 0·412; III and VI are relatively longer than in previous species.

MATERIAL EXAMINED.

Holotype ♂, slide no. RE-1408, from *Garrulax monileger fuscatus* Baker, THAILAND: Tha Kanun Hin Laem, Kanchanaburi Province (*R. E. Elbel & H. G. Deignan*) (USNM).

Two *Myrsidea* females, slide nos RE-4238, 4513, from *G. monileger schauenseei* Delacour & Greenway (THAILAND: Loei Province, 31.x.1954, 18.i.1955 (*R. E. Elbel*) (REC)) have the hypopharynx considerably reduced, tergum I normal, vulval margin feebly serrated, spermathecal duct opening in a bursa copulatrix, metasternal plate as in *erythrocephali* and the chaetotaxy as follows: metanotal setae 2 + 2, 1 + 2 (as inner seta absent on left-hand side); metapleural setae 4 + 4, 4 + 3 (outer most seta on left-hand side minute); metasternal setae 6, 8; outer dorsal setae of tibia I 5 + 5; setae of femoral brush 33 + 30, 29 + 27. Tergal setae: I, 11; II, 12, 9; III, 13, 11; IV, 12; V, 14, VI, 14, 12; VII, 9, 10; total of II–VII, 74, 68; VIII, 3 + 2, 3 + 3, the two central setae (broken on left-hand side in one) are very long and their ends extend greatly beyond the posterior margin of tergum IX; IX, 2 + 2, probably 3 + 3, long. Pleural setae: anterior setae present on pleurites II or III–VII; VIII, extra inner setae 2 + 1, 1 + 1, short to moderately long; outer and inner setae as in Text-fig. 27. Sternal setae. II, anterior 4 + 2, 3 + 3; marginal 15; aster 5 + 5, 4 + 4. Anterior setae on sternite II medio-lateral but not close to the 2 + 2 constant setae, those of the two sides separated by a small gap (Text-fig. 30). Their position is intermediate between that in *assamensis* and species having these setae



FIGS 25–28. *Myrsidea* species. 25, *orientalis*, ♂, from type-host, tibia I. 26, 27, *monilegeri*, genital region. 26, ♂, from type-host. 27, ♀, from *G. monileger schauenseei* (corona of anal setae omitted). 28, *monilegeri*, ♂, from type-host, pleurites I–VIII, ventral. i, inner seta; o, outer seta.

centrally (*erythrocephali* and *singularis*). Central and marginal setae on sternites III–VII as follows: central anterior; III, absent; IV, 7, 8; V, 9, 11; VI, 9; VII, 6. Central marginal; III, 10 9; IV, 11, 12; V, VI, 10; VII, 8. Total of anterior and marginal setae; IV, 18, 20; V, 19, 21; VI, 19; VII, 14. Total number on VII, 26, 28; genital region 8 + 5, 6 + 7; vulval marginal 14, 16, either the row is continuous or with a narrow median gap (Text-fig. 27). Marginal setae on sternite II and III in the form of a continuous row, as in *assamensis*.

MEASUREMENTS of 2♀. *Length*: total 1·92, 1·935; head 0·335, 0·34. *Breadth*: preocular 0·37, 0·39; temples 0·535, 0·56; pronotum 0·35, 0·37; metanotum 0·51, 0·53; broadest tergite 0·77. Length of post-spiracular setae: III 0·269–0·326, x̄ 0·293 (4); V 0·178–0·242, x̄ 0·202 (4); VI 0·330–0·412, x̄ 0·371 (4).

These females can be distinguished from those of all other taxa described here by the details of the chaetotaxy and have therefore been included in the key. As they share four characters (considerably reduced hypopharynx, anterior setae on the pleurites, two very long central setae on tergum VIII, the relative proportions of head setae 10 and 11) with the male of *monilegeri*, there is reasonable likelihood of their being that species. But *monilegeri* comes from a subspecifically different host, and as populations on subspecifically distinct birds are not always conspecific, the true status of these females, which are excluded from the type-series of *monilegeri*, must remain in abeyance until the availability of either females from the type-host of *monilegeri* or males from *G. m. schauenseei*.

Myrsidea assamensis sp. n.

(Pl. 1, fig. 57, Pl. 2, fig. 63; Text-figs 5, 24, 44)

Type-host: *Garrulax l. leucolophus* (Hardwicke).

This species resembles most closely *patkaiensis*, the distinguishing characters being given under that species. It is distinguished from those species parasitic on *Garrulax* (especially *monilegeri*) with a reduced hypopharynx as well as anterior setae on the pleurites by the details of the chaetotaxy, the arrangement of the setae on sternites II and III in the female being the most important, and by the genital sclerite in the male.

♀ and ♂. Hypopharynx considerably reduced but sometime to a greater extent in the female. In the female terga I and II normal; vulval margin entirely serrated, moderately so over the greater median portion and feebly laterally; the spermathecal duct and bursa copulatrix are not visible. In the male genitalia (Text-fig. 44) the parameres are strongly curved, generally rounded anteriorly, the inwardly directed arm of the basal apodeme is long and tapers posteriorly. In this species and three others (*monilegeri*, *patkaiensis* and *orientalis*) the genital sclerite is rather similar, having an anterior loop-like structure the outer arm of which is relatively dorsal and the inner relatively ventral, the difference being shown in the posterior part of the inner arms which in this species are partly fused (Pl. 2, fig. 63). Apex of metasternal plate greatly elongated in the female (Text-fig. 24), slightly less so in the male, being more elongated than in any other species dealt with here. Metanotal setae: ♀ (4), ♂ (4), 2 + 2. Metapleural setae: ♀ 4 (8 sides); ♂ 2 (8 sides). Metasternal setae: ♀ 9–10 (4); ♂ 7–10, x̄ 8·25 (4). Outer dorsal setae of tibia I: ♀ and ♂, 5–6, x̄, ♀ 5·14 (7 tibiae), ♂ 5·25 (8). Setae of femoral brush: ♀ 24–27, x̄ 26·50 (8 femora); ♂ 22–25, x̄ 23·62 (8).

ABDOMINAL CHAETOTAXY. Tergal setae: ♀ (Text-fig. 5) (4); I, 2 + 2 (3), 2 + 3 (1), the 2 central setae long and much longer than the 2 short to moderately long lateral ones; II, 12–13, x̄ 11·75; III, 13–14, x̄ 13·25; IV, 12–14, x̄ 13; V, 12–14, x̄ 12·50; VI, 10–13, x̄ 11·75; VII, 8–9, x̄ 8·75; II–VII, total 68–74, x̄ 70·75; VIII, 5–6, x̄ 4·75; IX, each side 2–4, total 4–8, x̄ 6. ♂ (4); I, 2 + 2; II, 7–8, x̄ 7·50; III, 10–11, x̄ 10·50; IV, 9–11, x̄ 10·50; V, 10–11, x̄ 10·25; VI, 9–10, x̄ 9·75; VII, 7–8, x̄ 7·75; II–VII, total 54–58, x̄ 56·25; VIII, 4–5, x̄ 4·25; IX, terminal 5. In both sexes the two central setae on tergum VIII are very long and extend far beyond the posterior margin of tergum IX. Pleural setae: anterior setae present on pleurites II–VI or VII in both sexes and their number in the male is smaller (II, 1; III, 2–4, x̄ 2·83 (6 sides); IV, 2–4, x̄ 3·14 (7); V, 2–3, x̄ 2·25 (8); VI, 1–2, x̄ 1·13 (8); VII, 0–1, x̄ 0·75 (8)) than in *monilegeri*. VIII, ♀, 1–2 extra short to medium inner setae each side; in both sexes outer and inner setae approximately as in *monilegeri*. Sternal setae. ♀ (4): II, anterior 5–7, x̄ 5·87 (8 sides), laterally on the sternite (close to the 2 + 2 constant setae), those of the two sides separated by a large gap, total 11–13, x̄ 12 (one seta is present centrally on the sternite in one); marginal 9; total of anterior and marginal 20–22, x̄ 21; aster 3–5, x̄ 3·75 (8 asters). III–VII, Tables I, V. Marginal setae on sternites II and III form a continuous row (Text-fig. 24); on II the gap between adjoining marginal setae in the middle is relatively wider than that between the lateral ones. Total number on VII, 22–26, x̄ 24; genital region 13–15; vulval marginal, each side 7–9, total 15–16, x̄ 15·75, those of the two sides separated by a narrow gap. ♂ (4): II, anterior 28–34, x̄ 30·75; marginal 14–16, x̄ 15; total of anterior and marginal 43–48; aster 4–5, x̄ 4·62 (8 asters); III–VII or VIII, Tables III, VI. Central anterior setae always present on sternite III. Total number on VII, 25–31, x̄ 28·75; genital region 18–20.

MEASUREMENTS of 4♀ and 4♂. *Length*: total, ♀ 1·795–1·935, x̄ 1·88; ♂ 1·50–1·55, x̄ 1·53. Head ♀ 0·33–0·34, x̄ 0·337; ♂ 0·31–0·32, x̄ 0·318. *Breadth*: preocular, ♀ 0·36–0·37, x̄ 0·364; ♂ 0·335–0·34, x̄ 0·338. Temples, ♀ 0·53–0·55, x̄ 0·537; ♂ 0·477–0·488, x̄ 0·485. Pronotum, ♀ 0·35–0·37, x̄ 0·36; ♂ 0·32–0·33, x̄ 0·328. Metanotum, ♀ 0·535–0·565, x̄ 0·55 (3); ♂ 0·43–0·44, x̄ 0·432. Broadest tergite: ♀ 0·76, 0·77, x̄ 0·765 (2); ♂ 0·63–0·65, x̄ 0·64. Length of post-spiracular setae: ♀, III 0·252–0·323, x̄ 0·285 (8); V 0·126–0·190, x̄ 0·155 (8); VI, 0·304–0·365, x̄ 0·345 (3). ♂, III 0·217–0·308, x̄ 0·262 (7); V 0·136–0·158, x̄ 0·144 (8); VI 0·309–0·324, x̄ 0·316 (6).

MATERIAL EXAMINED.

Holotype ♂, slide no. 13945*a*, from *Garrulax l. leucolophus* (Hardwicke), INDIA: Dehradun, Uttar Pradesh, i.1940 (*R. Meinertzhagen*) (BMNH).

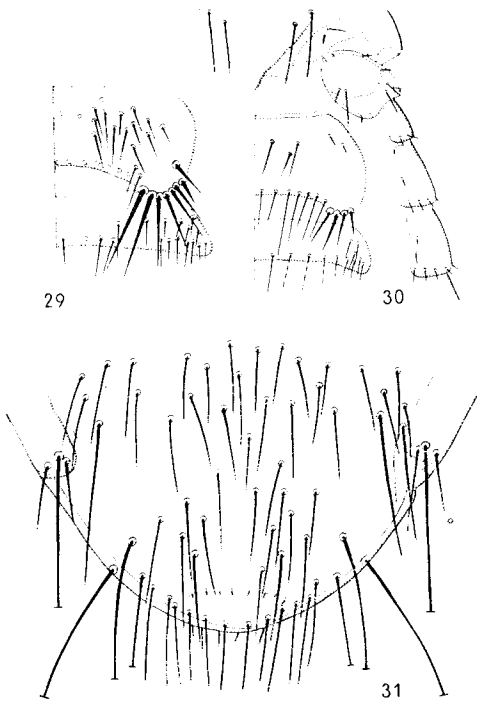
Paratypes. 3♂, 4♀, with data as given for holotype.

Specimens have also been seen from *Garrulax leucolophus patkaicus*, *G. l. belangeri*, *G. l. diardi* and a subspecifically unidentified *G. leucolophus*. While those from *G. l. patkaicus* have been described as a new species, those from the other hosts are discussed below and included in *M. assamensis* s. l.

The specimens from *G. l. belangeri* resemble *assamensis* in the form of the male genitalia, serrations of the vulval margin and the shape of the metasternal plate, but differ in having tergum I very slightly enlarged in the female and the hypopharynx slightly less reduced in both sexes. The spermathecal duct opens in a bursa copulatrix (Text-fig. 42), these structures not being visible in the nominate form. The measurements fall within the range of *assamensis* except for the metanotum (♀ 0·49–0·54, x̄ 0·52 (5); ♂ 0·38–0·40, x̄ 0.388 (5)) and broadest tergite (♀ 0·70–0·72, x̄ 0·71 (3); ♂ 0·55–0·60, x̄ 0·57 (5)) which are less wide, post-spiracular seta III in the female (0·185–0·254, x̄ 0·230 (10)) which is shorter and VI in the male (0·318–0·424, x̄ 0·363 (9)) which tends to be longer. As far as the chaetotaxy is concerned there tend to be fewer setae on tergum VIII (♀ 2 + 2 (9); ♂ 4–5, x̄ 4·25 (8)) and in the female on tibia I (4–5, x̄ 4·94 (16 tibiae)), but slightly more in the femoral brush in both sexes (♀ 25–32, x̄ 28·86 (15 femora); ♂ 23–30, x̄ 26·73 (15)) and significantly more on tergum IX in the female (9–13, x̄ 10·22 (9)). The pleural chactotaxy is also

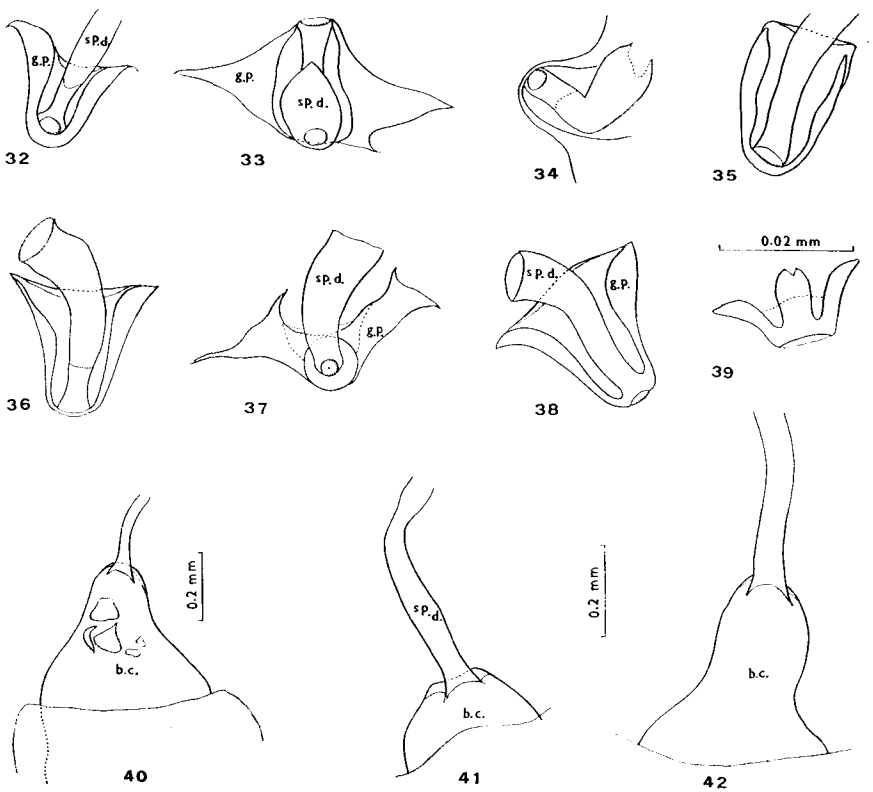
similar, although on VIII additional inner setae may be present in some males (1 + 1 (4), 0 + 1 (1), 0 (3)) and the inner seta may be slightly shorter. While the number of setae in both sexes and their arrangement in the female on sternite II agree closely with that of *assamensis* the number on sternites III–VII or VIII differs somewhat, that of the central anterior ones (1–5, x̄ 2·25 (8)) on sternite III in the male and in the genital region (♀ 11–16, x̄ 12·66 (9); ♂ 13–20, x̄ 17 (8)) being somewhat smaller.

The specimens from *G. l. diardi* also resemble *assamensis* in the male genitalia and the shape of the metatasternal plate, but differ in having tergum I slightly enlarged in the female, less pronounced serrations of the vulval margin medially and the hypopharynx slightly less reduced in both sexes (Pl. 1, fig. 57). In these also the spermathecal duct opens in a bursa copulatrix. The measurements also agree well with *assamensis*, except for post-spiracular seta III which tends to be shorter



FIGS 29–31. *Myrsidea* species. 29, *orientalis*, ♂, from *G. pectoralis subfusus*, sternites II and III. 30, *monilegeri*, ♀, from *G. monileger schauenseei*, methathorax and anterior abdominal segments, ventral. 31, *macraidoia*, ♂, from type-host, genital region. i, inner seta; o, outer seta.

(♀ 0·188–0·280, x̄ 0·227 (10); ♂ 0·185–0·269, x̄ 0·223 (10)). While the number of setae on the metanotum, metapleurite (♀ 3–5, x̄ 3·97 (32 sides); ♂ 1–3, x̄ 1·98 (46)), tibia I (♀ 3–6, x̄ 5 (34 tibiae); ♂ 4–5, x̄ 4·85 (28)) and in the femoral brush (♀ 20–32, x̄ 25·43 (30 femora); ♂ 21–29, x̄ 24·46 (28)) agrees well, that on the metasternal plate tends to be smaller (♀ 6–9, x̄ 8 (16); ♂ 6–10, x̄ 7·81 (16)). The abdominal chaetotaxy differs in the number of marginal setae on tergum IX in the female (7–10, x̄ 8·37 (11)), which is distinctly greater, and in the presence of additional inner setae on pleurite VIII in the male (1 + 1 (6), 0 + 1 (6), 0 (10)). On sternite II there are fewer



FIGS. 32–42. *Myrsidea* species. 32–38, spermathecal duct and genital papilla. 32, *singularis* 33, 34, *erythrocephali*. 35, *manipurensis*. 36, 37, *duplicata*. 38, *M.* sp. from *P. ferruginosus*. 39, internal sclerite in ♀ genitalia of *sehri* Ansari, holotype. 40–42, spermathecal duct and bursa copulatrix. 40, *orientalis* from type-host. 41, *monilegeri* from *G. monileger schauenseei*. 42, *assamensis* from *G. leucolophus belangeri*. Scale above 39 applies to figs 32–39, that between 41 and 42 to both these figs. b. c., bursa copulatrix; g. p., genital papilla; sp. d., spermathecal duct; orientation of structures as in the preparation.

anterior setae in the male (21–31, x̄ 24·88 (16); marginal 13–16, x̄ 14·94 (16); total of anterior and marginal 36–47) and fewer setae in the aster (♀ 2–4, x̄ 3·23 (34 asters); ♂ 3–5, x̄ 4·22 (32)), in the female one seta of the aster on one or both sides may be slightly or well removed from the others. The number of setae on sternites II–VII in the female and II–VIII in the male differs somewhat, the central anterior setae not being always present on sternite III in the male (0 (7), 1–3, x̄ 2·11 (9) or 1·19 (16)) and setae on the vulval margin (11–15, x̄ 13·60 (15)) and in the genital region (10–18, x̄, ♀ 12·64 (14), ♂ 13·12 (16) being fewer).

In specimens from *G. leucolophus* subsp.? the male genitalia, hypopharynx and metasternal plate resemble closely those of *assamensis* but in the female tergum I is very slightly enlarged and the feebly serrated vulval margin has more pronounced serrations laterally than medially. The chaetotaxy in general agrees well, that of sternite II in the female and pleurite VIII in both sexes being typical of *assamensis*. Central setae on tergum VIII are missing, except on one side of one male which is long, the size of the alveoli of the missing setae indicating that they also were very long. However, the number of setae on certain parts (femoral brush, ♂ 24–31, x̄ 26·25 (8 femora); IX, ♂, terminal 4–5, x 4·50 (4); genital region, ♀ 8, 10 (2); ♂ 10–12 (4)) differs somewhat.

Detailed comparison shows that specimens from *G. l. diardi* differ more from *assamensis* from the type-host than do those from *G. l. belangeri* but the differences are inadequate for their separation, as is also the case in specimens from *G. leucolophus*. Owing to their resemblance, therefore, to *assamensis* s. str. in the characters of the male genitalia, chaetotaxy of sternite II in the female, besides in several others, the specimens from *G. l. belangeri*, *G. l. diardi* and *G. leucolophus* subsp. ? have been included in *assamensis* s. l.

The data of this material, which is excluded from the type-series of *assamensis*, are listed below.

From *Garrulax leucolophus belangeri* Lesson, THAILAND: Tha Khanun Hin Laem, Kanchanaburi Province, 5♂, 8♀, 2.xi., 3.xi.1952 (*R. E. Elbel* & *H. G. Deignan*); 3♂, 1♀, 9.xi.1952 (*R. E. Elbel*) (EC and REC).

From *Garrulax leucolophus diardi* (Lesson), THAILAND: Chaiyaphum, Khon Kaen, Lampang, Lop Buri, Nakhon Phanom and Nan Provinces, 29 ♂, 42 ♀, between 29.xii.1951 and 7.vi.1955 (*R. E. Elbel* or *R. E. Elbel* & *H. G. Deignan* or *R. E. Elbel* & *B. Lekagul*) (EC and REC).

From *Garrulax leucolophus* (Hardwicke) subsp. ?, THAILAND: Nan Province, Ban ta Ler, 3♂, 1♀, 23.xi., 14.xii.1961; Ban Pha hang, 1♂, 1♀, 19.xii.1961 (*Kitti Thonglongya*) (EC).

Myrsidea patkaiensis sp. n.

(Text-figs 20, 23, 47, 54)

Type-host: *Garrulax leucolophus patkaicus* Reichenow.

This species is distinguished from *assamensis*, which it resembles most closely, by the fully developed hypopharynx, in the male by the genitalia and in the female by the arrangement of the central marginal setae on sternites II and III. Characters

which distinguish it from *bhutanensis*, the only other species having a fully developed hypopharynx as well as anterior setae on the pleurites, are given under that species.

♀ and ♂. Hypopharynx fully developed. In the female tergum I very slightly but perceptibly enlarged and tergum II very slightly modified; vulval margin feebly serrated medially, feebly to moderately laterally. Neither the spermathecal duct nor a bursa copulatrix is visible in either *pathaiensis* s. str. or s. l. Male genitalia as in *assamensis*, except for slight differences in the shape of the parameres where they articulate with the basal apodeme (Text-fig. 47) and the inner arms of the genital sclerite which are distinctive (Text-fig. 54). Apex of metasternal plate considerably produced in the female (Text-fig. 23) but only slightly in the male. Metanotal setae: ♀ 4 + 4 (2); ♂ 3 + 3 (3). Metapleural setae: ♀ 4–5, x̄ 4·25 (4 sides); ♂ 3–4, x̄ 3·16 (6). Metasternal setae: ♀ (2), ♂ (2), 8, 9. Outer dorsal setae of tibia I: ♀ (2), ♂ (3), 5 + 5. Setae of femoral brush: ♀ 24–30, x̄ 27 (4 femora); ♂ 22–30, x̄ 26·66 (6).

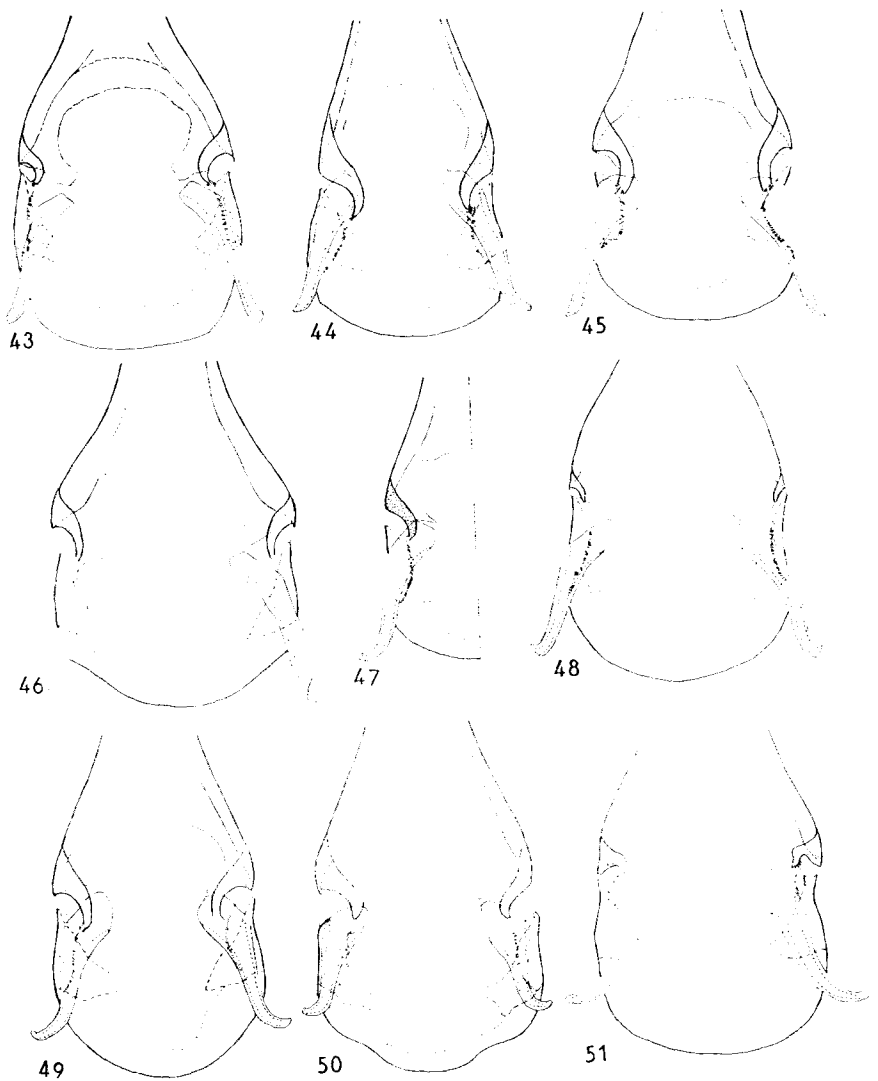
ABDOMINAL CHAETOTAXY. Tergal setae: ♀ (2): I, 3 + 3, 3 + 2, the 2 central setae long and considerably longer than the short to moderately long seta each side mediad to the post-spiracular seta; II, 15, 11; III, 16, 19; IV, 17, 12; V 15 ; VI, 11, 13; VII, 8, 9; total of II–VII, 82, 79; VIII, 2 + 2; IX, 2, 3. ♂ (3): I, 6–7, x̄ 6·33; II, 9–10, x̄ 9·66; III, V, 11–12, x̄ 11·33; IV, 12; VI, 10–11, x̄ 10·33; VII, 7; total of II–VII, 60–63, x̄ 61·66; VIII, 2 + 2 (2), 2 + 3 (1); IX, marginal 2–3, x̄ 2·66, terminal 4. In both sexes the 2 central setae on tergum VIII are very long and extend considerably or well beyond the posterior margin of tergum IX (Text-fig. 20). Pleural setae: ♀ (2); anterior setae present on the pleurities; II, 0–3, x̄ 1·25; III, 2–3, x̄ 2·25; IV, 1–3, x̄ 2·25; V, 1–3, x̄ 1·75; VI, 0–2, x̄ 0·75 each side. VIII, 0 + 1, 1 + 1 short, extra inner setae. ♂; on pleurites IV–VI only one anterior seta occurring on one or both sides. VIII, one specimen with 1 extra moderately long seta on one side. Outer and inner setae on VIII approximately as in *erythrocephali* in both sexes. Sternal setae. ♀ (2): II, anterior absent; marginal 7; aster 3 + 3. Central and marginal setae on sternites III–VII as follows: central anterior; II 1, absent; IV, 1; V, 6, 7; VI, 7; VII, 7, 5. Central marginal: III, 3, 4; IV, 6, 8; V, 9, 8; VI, 7, 9; VII, 5, 6. Total of central and marginal setae: IV, 7, 9; V, 15; VI, 14, 16; VII, 12, 11. On sternite II the 7, and on III the 3–4 central marginal setae arranged as follows: on II 3–4, on III 1–2 each side and those of the two sides separated by a large gap (Text-fig. 23); arrangement on II distinctive and on III resembles that in *bhutanensis*. Sternal brushes, Table V. Total number on VII, 21 18. Genital region 11, 12; vulval marginal, each side 4–5, total 9 those of the two sides separated by a large median gap. ♂ (3): II anterior 23–28, x̄ 25·66; marginal 15–16; total of anterior and marginal 39–43, x̄ 41; aster 3–4, x̄ 3·83 (6 asters); III–VII or VIII, Tables III, VI; total number on VII, 28, 25 (2); genital region 14–17, x̄ 15·66.

MEASUREMENTS of 2♀ and 3♂. *Length*: total, ♀ 1·65, 1·68; ♂ 1·38–1·455, x̄ 1·42. Head, ♀ 0·34; ♂ 0·29–0·31, x̄ 0·30. *Breadth*: preocular, ♀ 0·37; ♂ 0·32–0·335, x̄ 0·327. Temples, ♀ 0·53, 0·55; ♂ 0·47–0·48, x̄ 0·477. Pronotum, ♀ 0·33; ♂ 0·29–0·31, x̄ 0·30. Metanotum, ♀ 0·50, 0·51; ♂ 0·37–0·38, x̄ 0·374. Broadest tergite: ♀ 0·70, 0·71; ♂ 0·51–0·535, x̄ 0·522. Length of postspiracular setae: ♀, III 0·230–0·277, x̄ 0·258 (3); V 0·160–0·180, x̄ 0·170 (4); VI 0·371–0·394, x̄ 0·387 (3). ♂, III 0·185–0·261, x̄ 0·216 (3); V 0·138–0·163, x̄ 0·146 (6); VI 0·312, 0·382, x̄ 0·347 (2).

The interesting feature of this species is that although two setae on tergum VIII are very long in both sexes, in the female anterior setae are present on three to five (II or III to V or VI) pleurites and in the male one anterior seta usually occurs on one side only of one to three (IV–VI) pleurites. In this species therefore the male represents a somewhat intermediate condition in respect of these two characters, unlike *singularis* in which it is the female which represents the same condition.

MATERIAL EXAMINED.

Holotype ♂, slide no. 753, from *Garrulax leucolophus patkaicus* Reichenow, BURMA: Myitkyina, Kachin State, 22.xii.1944 (*H. S. Fuller*) (BMNH).

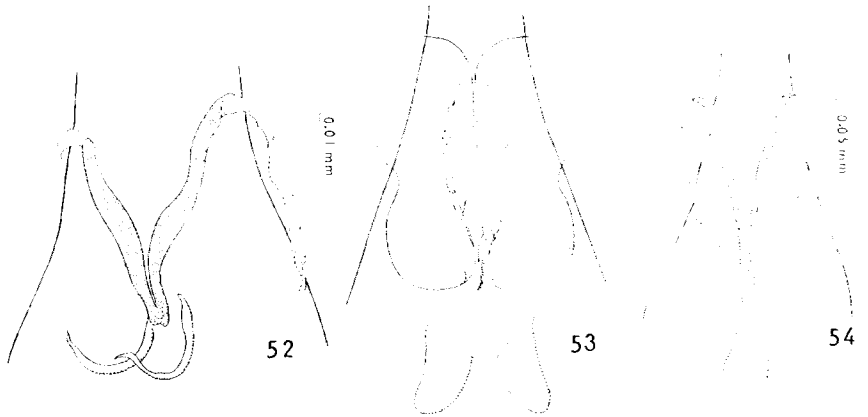


FIGS 43–51. *Myrsidea* species, ♂ genitalia (genital sac omitted). 43, *erythrocephali*. 44, *assamensis* from type-host. 45, *singularis*. 46, *bhutanensis*. 47, *patkaiensis* from type-host; inwardly directed arm of basal apodeme stippled. 48, *manipurensis*. 49, *orientalis* from type-host. 50, *monilegeri* from type-host. 51, *sikkimensis*.

Paratypes. 3♂ (1 pharate), 2♀, with data as given for holotype.

Specimens from *G. chinensis lochmius* agree with *patkaiensis* in the male genitalia; in the female in the form of anterior terga, arrangement of marginal setae on sternites II and III and serrations of the vulval margin; in both sexes in the form of the hypopharynx and the very long two central setae on tergum VIII; the measurements, except of post-spiracular seta V (♀ 0·163–0·244, $\bar{x}$ 0·191 (10); ♂ 0·153–0·173, $\bar{x}$ 0·163 (10)) which tend to be longer; and most of the chaetotaxy. However, the following setae tend to be more numerous: in the male the metanotals ($\bar{x}$ 7·66(3)), terminals on tergum IX (5 (4)) and the aster (4–5, $\bar{x}$ 4·16 (6 asters)); in the female on tergum I 6–8, $\bar{x}$ 7·57 (7)) and sternite II, the latter usually having anterior setae (each side 0–2, total 0–3, $\bar{x}$ 1·20 (10)), this being an important difference; in both sexes the total number on terga II–VII (♀ 81–100, $\bar{x}$ 88·66 (6); ♂ 66–73, $\bar{x}$ 68·50 (4)) and on metasternal plate (♀ 8–13, $\bar{x}$ 9·50 (8); ♂ 9–12, $\bar{x}$ 10·50 (4)) average more. Setae which tend to be less in number are in the male the metapleural setae ($\bar{x}$ 2·87 (8 sides)), those of the femoral brush (20–27, $\bar{x}$ 23·37 (8 femora)), anterior ones on sternite III (0–1, $\bar{x}$ 0·25 (4)), total number on sternite VII (21–27, $\bar{x}$ 23·25 (4)) and on pleurites II–VII, the anterior ones being absent altogether.

These differences are inadequate for the taxonomic separation of either sex from *patkaiensis* s. str.; further, until the range of variation of *patkaiensis* is known from a larger series, the differences cannot be accepted as final. Owing to their resemblance therefore with *patkaiensis* s. str. in the more important taxonomical characters, besides several others, the specimens from *G. chinensis lochmius* have been included in *patkaiensis* s. l.



FIGS 52–54. *Myrsidea* species, ♂ genital sclerite. 52, *monilegeri* from type-host; outer arm of the loop on left-hand side, being distorted, has been omitted. 53, *singularis*, posterior processes have been shown closer to the sclerite proper. 54, *patkaiensis*, holotype. Scale between figs 52 and 53 applies to both.

C

Specimens from a subspecifically unidentified *G. chinensis* resemble *patkaiensis* s. str. in the taxonomically important characters and the chaetotaxy in general. However, 1 + 1 widely separated anterior setae are present on sternite II in the female. Also the number of setae in the aster (4 (6 asters)), on sternites III (anterior 0–1, $\bar{x}$ 0·33) and VII (total number, $\bar{x}$ 23·66) in the male, and of certain other parts (metanotum, ♂ $\bar{x}$ 7·33; metasternal plate, ♀ 9, ♂ 8–11, $\bar{x}$ 9; tergum VIII, ♀ 4 + 4; tergum IX, ♂, terminal 5–6, $\bar{x}$ 5·33; genital region ♂ 14–21, $\bar{x}$ 17; vulval marginal 6 + 5) is slightly different from *patkaiensis* s. str. On the whole these specimens show greater resemblance to *patkaiensis* than do *patkaiensis* s. l. from *G. chinensis lochmius*, and have also been included in *patkaiensis* s. l.

The data of this material, which is excluded from the type-series of *patkaiensis*, are listed below.

From *Garrulax chinensis lochmius* Deignan, THAILAND: Chiang Rai and Loei Provinces, 10 ♀, 4 ♂, 23.ii.1953, 20.ii., 25.ii., 21.iii.1955 (*R. E. Elbel*, or *R. E. Elbel* & *H. G. Deignan*) (EC and REC).

From *G. chinensis* Scopoli subsp. ?, THAILAND: Chiang Mai Province, 1♀, 3♂, 7.iv.1962 (*K. Thonglongya*), 16.xii.1965 (MAPS-3340) (EC and REC).

One male from *G. mitratus*, presumably subsp. *major* (Robinson & Kloss), slide no. 1967–400 (MALAYA: Gunong Benom, 21.iii.1967) (BMNH) has a fully developed hypopharynx, the same type of genital sclerite as in *patkaiensis* s. str. and two very long setae on tergum VIII. The number of setae on the metapleurite (3 + 3), on pleurites IV–VII, tibia I (6 + 4), in the femoral brush (23 + 22), on terga II–VII (total 59), tergum I (3 + 2) and VIII (2 + 2) and in the genital region (9 + 7) is approximately or the same as in *patkaiensis* s. str. But the number of terminal setae (5) on tergum IX is slightly more and of anterior setae (19) on sternite II (total 34), both central and marginal setae respectively on the following sternites (III, 0, 9; IV 2, 9; V, 4, 9; VI, 3, 10; VII, 4, 7) is somewhat less. As there is no doubt that this male is conspecific with *patkaiensis*, it has been included in *patkaiensis* s. l.

Myrsidea orientalis sp. n.

(Pl. 2, fig. 64; Text-figs 6, 15, 25, 40, 49)

Type-host: *Garrulax p. pectoralis* (Gould).

This form is distinguished from those species parasitic on *Garrulax* which have a reduced hypopharynx, by the details of the chaetotaxy, including the greater number of dorsal setae on tibia I and in the brush on femur III, and by the genital sclerite.

♀ and ♂. Hypopharynx greatly reduced. In the female tergum I very slightly but perceptibly enlarged and II normal; vulval margin medially smooth but laterally feebly to moderately serrated. The spermathecal duct opens in a bursa copulatrix (Text-fig. 40) which contains concretions resembling those present in the bursa of *Myrsidea* from *Turdoides*. In the male genitalia (Text-fig. 49), while the shape of the parameres is rather similar to those of *sikkimensis*, the inwardly directed arm of the basal apodeme is distinctive, as is the inner ventral arm of the genital sclerite. Proportions of head seta 10 relative to 11 variable. Apex of metasternal plate slightly or well produced (Text-fig. 15). Metanotal setae: ♀ (2), ♂ (5), 2 + 2. Metapleural setae: ♀ 3–4, $\bar{x}$ 3·75 (4 sides); ♂ 2–3, $\bar{x}$ 2·60 (10). Metasternal setae: ♀ 11, 14; ♂ 13–20, $\bar{x}$ 15·80 (5). Outer dorsal setae of tibia I: ♀ 6–9, $\bar{x}$ 7·25 (4 tibiae); ♂ 6–10, $\bar{x}$ 8·44 (9). In this species only is the average of tibial setae above 7 in the female and above 8 in the male (Text-fig. 25); in all others dealt with here there are fewer, the range in both sexes being 3–6 (except one female of *macraidoia* having 7 + 6 setae) and the average for the species below 6. Setae of femoral brush are also more numerous: ♀ 37–43, $\bar{x}$ 39·25 (4 femora); ♂ 34–42, $\bar{x}$ 36·77 (9).

ABDOMINAL CHAETOTAXY. Tergal setae: ♀ (Text-fig. 6) (2); I, 8, 14; II, 11, 18; III, 17, 18; IV, 16, 17; V, 17, 19; VI, 14, 17; VII, 12, 15; total of II–VII, 90, 101; VIII, 0 + 3, 2 + 2; IX, 2 long. ♂; I, 7–9, $\bar{x}$ 8·20 (5); II, 10–12, $\bar{x}$ 11 (4); III, 14–15, $\bar{x}$ 14·40 (5); IV, 12–17, $\bar{x}$ 14·60 (5); V, 12–14, $\bar{x}$ 13·40 (5); VI, 13–14, $\bar{x}$ 13·60 (5); VII, 10–11, $\bar{x}$ 10·80 (5); total of II–VII, 75–81, $\bar{x}$ 78·50 (4); VIII, 5–6, $\bar{x}$ 5·60 (5); IX, terminal 4–5, $\bar{x}$ 4·80 (5). In both sexes the two central setae on tergum VIII are very long, extending well beyond the posterior margin of tergum IX (one male having 3 + 3 setae has 1 + 2 very long setae). Pleural setae; in both sexes anterior setae normally present on pleurites II–VII. VIII: ♀, extra inner setae 1 + 1, ? + 2, moderately long; ♂ 1 + 1 (4), 0 + 1 (1), this is the only species in which extra inner setae are normally present in the male; outer and inner setae in both sexes approximately as in *assamensis*. Sternal setae. ♀ (2): II, anterior 7 (1) each side (total 14, those of the two sides well separated); the other ♀ (allotype) with 15 setae scattered almost all over the sternite; marginal 15, 16; total of anterior and marginal 29, 31; aster 5–6, $\bar{x}$ 5·25 (4 asters). As the arrangement of the anterior setae on sternite II differs in the two females, the normal arrangement of this taxonomically important character remains unknown. However, in females from *G. pectoralis subfusus* considered to be conspecific there are 3–5 anterior setae each side, those of the two sides being separated by a large median gap. Central and marginal setae on sternites III–VII as follows: central anterior; III, absent; IV, 9, 12; V, 12, 15; VI, 13, 12; VII, 10, 13. Central marginal: III, 10, 12; IV, 13; V, 14, 12; VI, 11, 14; VII, 9, 10. Total of anterior and marginal setae: IV, 22, 25; V, 26, 27; VI, 24, 26; VII, 19, 23. Sternal, brushes, Table V. Total number on VII, 38, 42. Genital region 22; vulval marginal, 5 + 7, 7 + 5, those of the two sides separated by a rather narrow gap. Marginal setae on sternites II and III form a continuous row. ♂: II, anterior 25–28, $\bar{x}$ 26·75; marginal 17–21, $\bar{x}$ 18·25; total of anterior and marginal 42–49; aster 4–6, $\bar{x}$ 5·10 (10 asters); III–VII or VIII, Tables III, VI; total number on VII, 33–42, $\bar{x}$ 38 (5); genital region 14–18, $\bar{x}$ 15·80 (5). Sometime 1 or 2 setae each side anterior to the aster resemble the setae of the aster in proportions (Text-fig. 29).

MEASUREMENTS of 2♀ and 3–5♂. *Length*: total, ♀ 1·90; ♂ 1·55–1·66, $\bar{x}$ 1·62 (4). Head, ♀ 0·33, 0·35; ♂ 0·31–0·32, $\bar{x}$ 0·316 (5). *Breadth*: preocular, ♀ 0·35, 0·36; ♂ 0·33–0·35, $\bar{x}$ 0·34 (5). Temples, ♀ 0·55; ♂ 0·49–0·506, $\bar{x}$ 0·502 (5). Pronotum, ♀ 0·35; ♂ 0·33–0·34, $\bar{x}$ 0·334 (5). Metanotum, ♀ 0·535, 0·55; ♂ 0·42–0·45, $\bar{x}$ 0·43 (5). Broadest tergite: ♀ 0·82, 0·835; ♂ 0·66–0·68. $\bar{x}$ 0·665 (3). Length of post-spiracular setae: ♀, III 0·294–0·312, $\bar{x}$ 0·300 (3); V 0·117–0·215, $\bar{x}$ 0·191 (4); VI 0·459, 0·483, $\bar{x}$ 0·471 (2). ♂, III 0·277–0·383, $\bar{x}$ 0·327 (9); V 0·147–0·236, $\bar{x}$ 0·187 (9); VI 0·371–0·471, $\bar{x}$ 0·441 (9). While the range may overlap slightly with that of other species, the mean length of these setae is longer.

MATERIAL EXAMINED.

Holotype ♂, slide no. 19864, from *Garrulax p. pectoralis* (Gould), INDIA: Kangpokpi, Manipur, Assam State, 26.i.1952 (*R. Meinertzhagen*) (BMNH).

Paratypes. 1 ♀, with data as give for holotype and designated as allotype; 4 ♂ (1 dissected), 1 ♀, from *G. p. pectoralis*, BURMA: Myitkyina, Kachin State, 12.iii.1945 (*USA Typhus Commission*) (BMNH).

Specimens from *G. pectoralis subfusus* resemble *orientalis* in the form of anterior terga in the female, serrations of the vulval margin, the spermathecal duct and bursa copulatrix, the hypopharynx in both sexes and the male genitalia. While the chaetotaxy in general agrees well, some parts have more setae: the metanotum (♀ 5–11, $\bar{x}$ 7·83 (6); ♂ 4–8, $\bar{x}$ 5·75 (4)) and lateral brushes on sternites IV and V in both sexes, considerably more on tibia I (9–11, $\bar{x}$ 9·73 (11 tibiae)) and the femoral

brush (39–53, x̄ 45·70 (10 femora)) in the female. The setae on the metasternal plate (♀ 8–12, x̄ 9·83 (6); ♂ 7–12, x̄ 9·50 (4)) and anterior ones on sternite II in the female (3–5 each side, total 6–9, x̄ 8·33 (6)) are fewer. Further, the female measures slightly larger and post-spiracular setae III, V and VI in this sex and V in the male are longer. While the anterior setae on sternite II in the female are arranged as in *assamensis* a comparison with *orientalis* is precluded as the normal arrangement in that form is unknown.

These differences are considered inadequate for separating these specimens from *orientalis* from the type-host, and they are therefore included in *orientalis* s. l.

Measurements. Length of ♀: total 2·00–2·105, x̄ 2·03 (5). *Breadth* of ♀: preocular 0·365–0·39, x̄ 0·376 (5); pronotum 0·36–0·38, x̄ 0·37 (5); metanotum 0·55–0·57, x̄ 0·56 (5); broadest tergite 0·87–0·88, x̄ 0·878 (4). Length of post-spiracular setae: ♀, III 0·430–0·518, x̄ 0·475 (10); V 0·324–0·400, x̄ 0·366 (10); VI 0·459–0·512, x̄ 0·479 (9). ♂, V 0·230–0·383, x̄ 0·333 (6).

The data of this material, which is excluded from the type-series of *orientalis*, are as follows:

7 ♀, 4 ♂, from *Garrulax pectoralis subfusus* Kinnear, Thailand: Chiang Rai, Kanchanaburi and Prachuap Khiri Khan Provinces, 16.xi., 21.xii.1952, 3.iii.1953 (*R. E. Elbel & H. G. Deignan*) (EC and REC).

Myrsidea macraidoia sp. n.

(Pl. 1, fig. 58; Text-figs 7, 8, 16, 31)

Type-host: *Garrulax a. albogularis* (Gould).

This form, the largest of the species dealt with here, is distinguished from those species from *Garrulax* in which the hypopharynx is reduced by the details of the chaetotaxy, particularly the large number of setae in the genital region, and by the male genitalia.

♀ and ♂. Hypopharynx considerably reduced. In the female tergum I normal, vulval margin not serrated. Microtrichia of the genital chamber as in *M. abidae* (see Clay, 1966: fig. 24) but slightly longer; in the spermatheca only the long duct is visible, with a typical calyx (as shown in fig. 2 in Clay, 1968) at its anterior end. Male genitalia and the distinctive genital sclerite large, hence the name of the species. Head seta 10 extends well beyond the middle of seta 11 but falls short of the tip of the latter, being relatively longer than in most species (Text-fig. 9). Apex of metasternal plate considerably elongated as in female *pathaiensis*. Metanotal setae: ♀ 8–10 (8); ♂ 4–8, x̄ 6·25 (4). Metapleural setae: ♀ 4–5, x̄ 4·63 (22 sides); ♂ 3–5, x̄ 4·25 (12). Metasternal setae: ♀ 8–10 (10); ♂ 8–9 (4). Outer dorsal setae of tibia I: ♀ 5 + 5 (7), 7 + 6 (1), x̄ 5·16 (18 tibiae); ♂ 4–5, x̄ 4·71 (8). Setae of femoral brush: ♀ 20–32, x̄ 27·35 (20 femora); ♂ 18–33, x̄ 26 (11).

Abdominal chaetotaxy. Tergal setae (Text-figs 7, 8): ♀; I, 12–16, x̄ 13·85 (7); II, 16–20, x̄ 17·33 (6); III, 16–20, x̄ 17·57 (7); IV, 15–21, x̄ 18·14 (7); V, 18–21, x̄ 19 (7); VI, 16–23, x̄ 19·11 (9); VII, 18–21, x̄ 19·33 (9); total of II–VII, 103–119, x̄ 108·66 (6); VIII, 13–16, x̄ 14·88 (9); IX, each side 3–6 (1 may be removed from the others and close to the lateral, very long and stout seta), total 8–11, x̄ 9·29 (9). ♂; I, 9–11, x̄ 10 (5); II, 12–14, x̄ 13·66 (6); III, 15–17, x̄ 15·80 (5); IV, 14–18, x̄ 16·33 (6); V, 17–20, x̄ 18 (6); VI, 16–19, x̄ 17·40 (5); VII, 15–19, x̄ 16·20 (5); total of II–VII, 94–103, x̄ 98·25 (4); VIII, 12–13, x̄ 12·40 (5); IX, terminal 5–6, x̄ 5·80 (5). Tergum VIII in both sexes with 1 + 1 very long setae, extending far beyond the posterior margin of tergum IX. Pleural setae: anterior setae present on pleurites II–VI or VII in the female and II–VI in the male. VIII: ♀, extra inner setae may be present on one or both sides, moderately long to long (total 3 (1), 2 (4), 1 (4), 0 (2)); outer and inner setae in both sexes as in Text-fig. 16. Sternal setae. ♀: II, anterior 17–20, x̄ 18·77 (9), present almost all over the sternite; marginal 16–19, x̄ 17·44 (9); total of anterior and marginal 34–39; aster 4–6, x̄ 4·27 (22 asters); III–VII, Tables I, V; total number on VII, 45–50, x̄ 48·33 (11); genital region 39–50, x̄ 44·10 (10); vulval marginal 19–27, x̄ 24·20 (10), forming a continuous row. ♂: II, anterior 15–19, x̄ 17·80 (5); marginal 16–18, x̄ 16·40 (5); total of anterior and marginal 31–37; aster 4–5, x̄ 4·41 (12); III–VII or VIII, Tables III, VI; total number on VII, 41–45, x̄ 42·33 (6); genital region 30–35, x̄ 32·20 (5). This species has the most numerous setae in the genital region (Text-fig. 31) of both sexes and on the vulval margin of the female.

Measurements. *Length*: total, ♀ 2·04–2·06, x̄ 2·15 (7); ♂ 1·92–2·18, x̄ 2·06 (4). Head, ♀ 0·35–0·38, x̄ 0·364 (6); ♂ 0·347–0·365, x̄ 0·352 (6). *Breadth*: preocular, ♀ 0·38–0·41, x̄ 0·40 (6); ♂ 0·365–0·38, x̄ 0·37 (6). Temples, ♀ 0·56–0·59, x̄ 0·58 (6); ♂ 0·535–0·55, x̄ 0·54 (6). Pronotum, ♀ 0·37–0·41, x̄ 0·39 (6); ♂ 0·365–0·371, x̄ 0·367 (6). Metanotum, ♀ 0·50–0·535, x̄ 0·52 (6); ♂ 0·42–0·47, x̄ 0·45 (6). Broadest tergite: ♀ 0·76–0·835, x̄ 0·80 (6); ♂ 0·65–0·68, x̄ 0·66 (4). Length of post-spiracular setae: ♀, III 0·230–0·274, x̄ 0·255 (7); V 0·160–0·195, x̄ 0·180 (10); VI 0·353–0·481, x̄ 0·429 (8). ♂, III 0·072–0·123, x̄ 0·102 (8); V 0·044–0·070, x̄ 0·054 (7); VI 0·353–0·471, x̄ 0·400 (5). The striking feature is the short size of post-spiracular seta V in the male.

Material examined.

Holotype ♂, slide no. 15128*a*, from *Garrulax a. albogularis* (Gould), India: Punjab, x.1943 (*R. Meinertzhagen*) (BMNH).

Paratypes. 3♂ (1 dissected), 8 ♀, with data as given for holotype; 2♂ (1 dissected), 3 ♀, from *G. a. albogularis*, Nepal: x. and xii.1935 (*R. Meinertzhagen* 4533, 4861) (BMNH).

Two females from *G. albogularis whistleri* Baker (Sikkim: Lachung, 17.ii.1952 (*R. Meinertzhagen*, 19949 (BMNH)) resemble *macraidoia* in the degree of reduction of the hypopharynx, the form of anterior abdominal terga, but neither the spermathecal duct nor a bursa are visible. The measurements fall within the range of that species, as also the number of setae, except for that on certain parts which differs slightly as follows: Tergal (2); I, 11; II-VII, total 101, 104; IX, 12, 14 (fewer on I–VII, more on IX); anterior setae on sternite III, 6. However, they differ markedly in having two very long setae each side of tergum VIII instead of one as in *macraidoia*. While this character separates these particular females from *macradoia*, a large series is necessary to determine the constancy of this difference in populations from these two subspecies of *G. albogularis*. Further, a close and satisfactory comparison is precluded as no male is available from *G. a. whistleri*. With these limitations and because of otherwise close resemblance with *macraidoia*, it has been considered more satisfactory to include these two females in *macradoia* s. l., but not in the type-series.

Key to the species of *Myrsidea* parasitic on *Garrulax* and *Pomatorhinus*

In the key to the males preference has been given to non-sexual characters, those of the male genitalia being used more for confirmation of identification. The placing of *M. sehri* Ansari proved difficult owing to the poor state of the type-specimens and the lack of the range of variation of key characters. For taxa parasitizing more than one host-species or subspecies, the range of variation of the specimens from all the hosts has been given, not only of those from the type-host on which the taxon s. str. is based.

Females

1		Hypopharynx fully developed (as in Pl. 1, fig. 55) 2
–		Hypopharynx reduced to varying degrees (Pl. 1, figs 56, 57) . . . 5
2	(1)	Pleurites II–VI without anterior setae; longest tergal seta on VIII may just cross posterior margin of tergum IX; anterior setae on sternite II present centrally 3
–		Pleurites IV and V always, II, III and VI usually with anterior setae; 2 tergal setae on VIII extend well beyond posterior margin of tergum IX; anterior setae on sternite II either absent or present only laterally (Text-figs 22, 23) 4
3	(2)	Tergum I considerably enlarged and II slightly modified; the 2 central setae on I finer and shorter than the outer ones (Text-fig. 3). ***manipurensis*** sp. n. (p. 377)
–		Tergum I very slightly enlarged and II normal; the 2 central setae on I markedly longer than the 2 outer ones (as in Text-fig. 1). ***duplicata*** sp. n. (p. 379)
4	(2)	12–13 ($\bar{x}$ 12·66) setae on tergum I; 11–14 ($\bar{x}$ 12·66) setae on metanotum and 9–10 ($\bar{x}$ 9·33) on tergum VIII; on sternite II 4 or more ($\bar{x}$ over 6) anterior setae (Text-fig. 22) . . . . . ***bhutanensis*** sp. n. (p. 385)
–		5–8 ($\bar{x}$ under 8) setae on tergum I; 8–9 ($\bar{x}$ under 9) setae on metanotum and 4–6 ($\bar{x}$ under 6) on tergum VIII; on sternite II 0–3 ($\bar{x}$ under 3) anterior setae (Text-fig. 23) . . . . . ***patkaiensis*** sp. n. (p. 394)
5	(1)	Metanotum enlarged with 16–19 marginal setae; pleurite I with 9–11 long marginal setae forming a frill (Text-fig. 4) . . ***singularis*** sp. n. (p. 382)
–		Metanotum normal having under 11 marginal setae; marginal setae on pleurite I short and spiniform (Text-fig. 1) 6
6	(5)	Pleurites II–VI without anterior setae; the more central setae on tergum VIII not extending beyond posterior margin of tergum IX (Text-fig. 1) . . 7
–		Pleurites II or III–VI with anterior setae; 2 tergal setae on VIII extending well beyond posterior margin of tergum IX (Text-figs 5–7) 9
7	(6)	Terga I and II normal . . . . . ***sehri*** Ansari (p. 374)
–		Tergum I slightly or considerably enlarged, II normal or slightly modified 8
8	(7)	The 2 central setae on tergum I long and markedly longer than the 2 lateral ones (Text-fig. 1) . . . . . ***erythrocephali*** sp. n. (p. 375)
–		The 2 central setae on tergum I short and fine and the 2 lateral ones slightly longer but considerably stouter (as in Text-fig. 3). ***thailandensis*** sp. n. (p. 382)
9	(6)	Tergum IX with 2 marginal setae (Text-fig. 6); 37–53 ($\bar{x}$ above 39) setae in femoral brush and 6–11 ($\bar{x}$ above 7) dorsal setae on tibia I. ***orientalis*** sp. n. (p. 398)
–		Tergum IX with 4–13 ($\bar{x}$ 5–10) marginal setae (Text-figs 5, 7); under 35 ($\bar{x}$ under 30) setae in femoral brush and normally 4–6 ($\bar{x}$ under 5·25) dorsal setae on tibia I 10
10	(9)	Tergum I with 4 ($\bar{x}$ under 5) setae (Text-fig. 5). On sternite II 3–9 setae present each side (Text-fig. 24) separated by a large gap (total 6–16) ***assamensis*** sp. n. (p. 390)
–		Tergum I with 7–16 ($\bar{x}$ above 8) setae 11
11	(10)	5–6 setae on tergum VIII and 13 in the genital region (Text-fig. 27). On sternite II 2–4 anterior setae each side (Text-fig. 30) separated by a gap (total 6) ***monilegeri*** sp. n.? (p. 388)
–		13–16 setae on tergum VIII (Text-fig. 7) and 39–50 in the genital region. On sternite II 17–20 anterior, centrally located setae . ***macraidoia*** sp. n. (p. 400)

Males

1		Hypopharynx fully developed (Pl. 1, fig. 55) 2
–		Hypopharynx reduced to varying degrees (as in Pl. 1, figs 56, 57) . . 5
2	(1)	Tergum I with 4 setae; longest tergal seta on VIII may just cross posterior margin of tergum IX 3
–		Tergum I with 5–13 setae; the 2 central setae on tergum VIII normally very long, extending well beyond posterior margin of tergum IX (Text-fig. 20) 4
3	(2)	Inwardly directed arm of basal apodeme short (Text-fig. 48). ***manipurensis*** sp. n. (p. 377)
–		Inwardly directed arm of basal apodeme significantly larger (as in Text-fig. 43). ***duplicata*** sp. n. (p. 379)
4	(2)	On tergum I 9–13 ($\bar{x}$ 11·25) (Text-fig. 18) and on VIII 8–9 ($\bar{x}$ 8·25) setae; genital sclerite as in Pl. 2, fig. 62 . . . . ***bhutanensis*** sp. n. (p. 385)
–		On tergum I 5–8 ($\bar{x}$ under 7) setae and on VIII 4–6 ($\bar{x}$ under 5) setae (Text-fig. 20); genital sclerite as in Text-fig. 54 . . . ***patkaiensis*** sp. n. (p. 394)
5	(1)	Pleurites II–VII without anterior setae (Text-fig. 2); the more central setae on tergum VIII may just cross posterior margin of tergum IX (Text-fig. 19) 6
–		Pleurite V always, II–IV and VI usually and, VII occasionally with anterior setae (Text-fig. 28); 2 tergal setae on VIII extend well beyond posterior margin of tergum IX (Text-fig. 8) 9
6	(5)	6–7 ($\bar{x}$ 6·25) setae on tergum I, 8–9 ($\bar{x}$ 8·25) metanotal setae (Text-fig. 17); genital sclerite as in Text-fig. 53 . . . . ***singularis*** sp. n. (p. 382)
–		4 setae on tergum I, 4–5 ($\bar{x}$ under 5) metanotal setae; genital sclerite not as above 7
7	(6)	Sternites IV–VI without central anterior setae; genital sclerite as in Pl. 2, fig. 61. ***sikkimensis*** sp. n. (p. 382)
–		Sternites IV–VI with central anterior setae (Text-fig. 2); genital sclerite not as above 8
8	(7)	7 anterior setae on sternite II (Text-fig. 21); genital sclerite as in Pl. 2, fig. 59. ***sehri*** Ansari (p. 374)
–		10–15 anterior setae on sternite II (Text-fig. 2); genital sclerite as in Pl. 2, fig. 60. ***erythrocephali*** sp. n. (p. 375)
9	(5)	12–13 ($\bar{x}$ 12·40) setae on tergum VIII and 30–35 ($\bar{x}$ 32·20) in the genital region (Text-figs 8, 31); genitalia as in Pl. 1, fig. 58 . . ***macraidoia*** sp. n. (p. 400)
–		4–7 ($\bar{x}$ under 7) setae on tergum VIII and 10–20 ($\bar{x}$ under 20) in the genital region (Text-fig. 26); genitalia not as above 10
10	(9)	34–42 ($\bar{x}$ above 36) setae in the femoral brush and 6–11 ($\bar{x}$ above 8) dorsal setae on tibia I (Text-fig. 25); genital sclerite as in Pl. 2, fig. 64. ***orientalis*** sp. n. (p. 398)
–		Under 31 ($\bar{x}$ under 28) setae in the femoral brush and 4–6 ($\bar{x}$ under 5·50) dorsal setae on tibia I; genital sclerite not as above 11
11	(10)	Genitalia and genital sclerite as in Text-figs 50, 52 . ***monilegeri*** sp. n. (p. 388)
–		Genitalia and genital sclerite as in Text-fig. 44 and Pl. 2, fig. 63. ***assamensis*** sp. n. (p. 390)

HOST-PARASITE LIST

The arrangement of hosts is according to Deignan (1964). Type-hosts are marked with an asterisk (*).

Host	*Myrsidea* Species (*cont*).	Page
Garrulax		
G. albogularis whistleri	*M. macraidoia* sp. n., s.l.	400
**G. a. albogularis*	*M. macraidoia* sp. n.	400
G. leucophus	*M. assamensis* sp. n., s.l.	390
**G. l. leucolophus*	*M. assamensis* sp. n.	390
**G. leucolophus patkaicus*	*M. patkaiensis* sp. n.	394
G. leucolophus belangeri	*M. assamensis* sp. n., s.l.	390
G. leucolophus diardi	*M. assamensis* sp. n., s.l.	390
**G. monileger fuscatus*	*M. monilegeri* sp. n.	388
G. monileger schauenseei	*M. monilegeri* sp. n. ?	388
**G. p. pectoralis*	*M. orientalis* sp. n.	398
G. pectoralis subfusus	*M. orientalis* sp. n., s.l.	398
**G. striatus sikkimensis*	*M. sikkimensis* sp. n.	382
G. chinensis	*M. patkaiensis* sp. n., s.l.	394
G. chinensis lochmius	*M. patkaiensis* sp. n., s.l.	394
G. mitratus (? *major*)	*M. patkaiensis* sp. n., s.l.	394
**G. ruficollis*	*M. bhutanensis* sp. n.	384
** G. merulinus*	*M. thailandensis* sp. n.	381
**G. l. lineatus*	*M. sehri* Ansari, 1951	374
**G. squamatus*	*M. manipurensis* sp. n.	377
**G. s. subunicolor*	*M. singularis* sp. n.	382
**G. erythrocephalus*	*M. erythrocephali* sp. n.	375

DISCUSSION

In *Myrsidea* parasitic on the Turdinae and on *Turdoides* (Clay, 1966; Tandan & Clay, 1971) divisions into species-groups can be based on both non-sexual and sexual characters, the former enabling the grouping together of both sexes. In the 13 species of *Myrsidea* from *Garrulax* and *Pomatorhinus* most of the non-sexual characters are similar, making the grouping together of the sexes not feasible. However, the sexual characters do enable groups based on different sexes to be formed. The females are divisible into two groups, A and B as listed below, according to the nature of the structure associated with the opening of the spermathecal duct, while the males of some of the species can be arranged according to the genital sclerite. Two species, *sehri*, in which the female character has not been seen satisfactorily, and *patkaiensis*, in which it has not been seen at all, have been assigned their respective groups on the basis of the resemblance of the male genital sclerite; *macraidoia*, in which the bursa has also not been seen, is included in group B on the presumption that it has a thin-walled, hence not easily visible, bursa copulatrix. As the available material is considered insufficient to decide which grouping, whether based on female or male genitalia, would be more satisfactory, recognition of species-groups has been deferred until *Myrsidea* from more taxa of *Garrulax* and *Pomatorhinus* is available.

In the *Check-List of Birds of the World* (volume **10,** 1964), Deignan included 44 species in *Garrulax* and 8 in *Pomatorhinus*, most of the species of the former and all of the latter genus being polytypic. As specimens of *Myrsidea* have been seen from only 13 species of *Garrulax* (two monotypic and 11 polytypic) and three species of *Pomatorhinus*, the amount of material available for host-parasite deductions is comparatively small. No useful deductions on the relationships of the hosts can therefore be made from the two groups into which the females of the parasite species have been divided, but the relationships of the species within the groups are certainly informative. These affinities have been based on the form of the male genital sclerite as this structure, as in other groups of *Myrsidea* (see also Clay, 1962: 194), seems to show the most reliable characters indicative of the affinities of the species. According to this character: (1) the species parasitic on *Garrulax erythrocephalus* (*Myrsidea erythrocephali*), *Pomatorhinus erythrogenys* (*Myrsidea* sp.), *G. squamatus* (*M. manipurensis*), *P. schisticeps* (*M. duplicata*) and *P. ferruginosus* (*Myrsidea* sp.) are closer to each other than to those parasitic on other species of *Garrulax* and (2) the species living on *G. leucolophus patkaicus* (*M. patkaiensis*), also parasitic on *G. chinensis lochmius* and *G. mitratus* (? *major*), is specifically distinct from that living on three other conspecific subspecies, *G. l. leucolophus*, *G. l. belangeri* and *G. l. diardi*. Since *Myrsidea* from different subspecies is frequently specifically distinct, less frequently even strikingly enough to belong to different species-groups, all that can be inferred from these affinities is the possibility that the particular subspecies of *G. erythrocephalus*, *P. erythrogenys*, *P. schisticeps* and *P. ferruginosus*, as also the monotypic *G. squamatus*, from which the specimens came, may be more closely related to each other than hitherto suspected, and that *G. l. patkaicus* may be closer to *G. chinensis lochmius* and *G. mitratus* (? *major*) than to *G. l. leucolophus*, *G. leucolophus belangeri* and *G. leucolophus diardi*.

	Myrsidea Species	Host species
A	*M. sehri* Ansari, 1951	*Garrulax l. lineatus*
A	*M. erythrocephali* sp. n.	*Garrulax erythrocephalus*
A	*M.* sp.	*Pomatorhinus erythrogenys*
A	*M. manipurensis* sp. n.	*Garrulax squamatus*
A	*M. duplicata* sp. n.	*Pomatorhinus schisticeps*
A	*M.* sp.	*Pomatorhinus ferruginosus*
A	*M. thailandensis* sp. n.	*Garrulax merulinus*
A	*M. sikkimensis* sp. n.	*Garrulax striatus sikkimensis*
A	*M. singularis* sp. n.	*Garrulax s. subunicolor*
A	*M. bhutanensis* sp. n.	*Garrulax ruficollis*

B	*M. monilegeri* sp. n.	*Garrulax monileger fuscatus*
		Garrulax monileger schauenseei
	M. assamensis sp. n.	*Garrulax l. leucolophus*
		Garrulax l. belangeri
		Garrulax l. diardi
	M. patkaiensis sp. n.	*Garrulax leucolophus patkaicus*
		Garrulax chinensis lochmius
		Garrulax mitratus (? *major*)
	M orientalis sp. n	*Garrulax p. pectoralis*
		Garrulax pectoralis subfusus
	M. macraidoia sp. n.	*Garrulax a. albogularis*
		Garrulax albogularis whistleri

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TABLE I

Central setae of sternites, ♀

		erythrocephali		*assamensis*		*singularis*		*macraidoia*	
		Range	Mean	Range	Mean (4)	Range	Mean (5)	Range	Mean (6)
III	Anterior	Absent*		Absent		Absent		0–3	0·9
	Marginal	12–15	13·6 (7)	7–9	7·8	14–15	14·8	12–17	15·4
	Total							13–19	16·4 (11)
IV	Anterior	5–9	7·0	3–6	4·2	0–4	2·6	13–18	15·3
	Marginal	10–15	12·8	9–11	10·0	13–15	14·2	13–16	14·3
	Total	16–23	19·8 (6)	12–17	14·2	15–19	16·8	26–32	29·7
V	Anterior	6–10	7·8	4–7	5·5	4–7	4·8	14–18	15·8
	Marginal	10–13	11·8	9–11	10·5	13–14	13·2	12–15	13·8
	Total	18–23	19·7 (6)	14–19	16·0	17–21	18·0	28–32	29·7
VI	Anterior	5–7	6·2	5–9	6·8	5–10	7·6	15–19	16·8
	Marginal	10–12	11·0	9–10	9·25	11–14	13·2	12–14	13·2
	Total	16–18	17·2 (5)	14–19	16·0	17–24	20·8	27–33	30·0
VII	Anterior	5–11	7·4	4–9	6·8	15–18	16·2	15–20	18·0
	Marginal	5–7	6·2	7–8	7·2	7–10	9·0	10–13	11·7
	Total	10–18	13·6 (5)	12–16	14·0	23–28	25·2	27–33	29·7

* One seta in 1 out of 7.

TABLE II

Central setae of sternites, ♂

		erythrocephali		*manipurensis*		*singularis*		*bhutanensis*	
		Range	Mean	Range	Mean (4)	Range	Mean (4)	Range	Mean
III	Anterior	Absent*		Absent		0–1	0·5	2–5	3·2
	Marginal	10–13	11·5 (8)	9–10	9·5	12–17	15·0	12–14	12·8
	Total					12–18	15·5	14–19	16·0 (4)
IV	Anterior	4–7	5·2	2–5	3·5	2–4	2·8	7–9	8·0
	Marginal	10–12	11·2	9–11	10·2	11–14	12·2	12–13	12·3
	Total	14–18	16·4 (5)	13–15	13·8	13–18	15·0	19–22	20·3 (3)
V	Anterior	2–7	5·4	3–5	3·5	4–5	4·2	7–10	8
	Marginal	10–12	11·0	8–11	9·8	12–14	12·8	11–13	12·3
	Total	13–18	16·4 (5)	11–16	13·2	16–18	17·0	18–23	20·3 (3)
VI	Anterior	2–6	4·4	4–5	4·2	5–8	6·2	7–8	7·7
	Marginal	8–11	9·4	8–10	9·0	10–11	10·5	10–11	10·3
	Total	10–15	13·8 (5)	12–14	13·2	15–18	16·8	17–19	18·0 (3)
VII	Anterior	3–7	5·0	4–7	5·0	6–10	8·5	7–9	8·0
	Marginal	7–10	8·6	8–9	8·2	7–11	9·2	9–11	10·0
	Total	10–16	13·6 (5)	12–15	13·2	15–20	17·8	17–20	18·0 (3)
VIII	Anterior	2–5	3·8	3–5	3·8	4–8	6·5	3–6	4·3
	Marginal	6–8	6·4	6–7	6·2	6–10	8·2	7–9	8·0
	Total	9–11	10·1 (8)	9–11	10·0	12–17	14·8	10–14	12·3 (3)

* One seta in 1 out of 8.

TABLE III

Central setae of sternites, ♂

		assamensis		*patkainesis*		*orientalis*		*macraidoia*	
		Range	Mean (4)	Range	Mean	Range	Mean (5)	Range	Mean
III	Anterior	4–7	5·2	0–3	1·7	0–3	0·6	3–5*	3·6
	Marginal	11–14	12·5	10–11	10·7	14–16	15·2	12–16	13·8
	Total	15–19	17·8	10–14	12·3 (3)	15–17	15·8	15–20	17·4 (5)
IV	Anterior	7–11	8·8	6, 4		5–9	7·4	10–13	11·8
	Marginal	12–13	12·5	11, 10		11–15	13·6	12–14	12·8
	Total	20–23	21·2	17, 14	15·5 (2)	19–23	21·0	23–26	24·7 (6)
V	Anterior	6–10	7·8	7, 6		6–12	9·0	9–15	12·2
	Marginal	10–13	11·8	10, 8		12–15	13·4	11–12	11·5
	Total	17–23	19·5	17, 14	15·5 (2)	19–27	22·4	20–27	23·7 (6)
VI	Anterior	6–10	7·8	6, 7		7–10	8·6	9–12	10·8
	Marginal	11–12	11·5	9, 9		10–14	12·0	10–12	11·2
	Total	18–21	19·2	15, 16	15·5 (2)	18–24	20·6	19–24	22·0 (6)
VII	Anterior	7–9	8·0	9, 5		6–12	9·2	12–15	13·8
	Marginal	7–10	9·0	8, 8		10–12	11·2	11–13	11·5
	Total	15–19	17·0	17, 13	15·0 (2)	16–24	20·4	24–27	25·3 (6)
VIII	Anterior	4–6	4·8	2–6	4·0	3–8	5·6	14–18	15·6
	Marginal	7–9	8·0	6–7	6·7	8–10	9·0	9–11	10·6
	Total	11–13	12·8	9–13	10·7 (3)	12–17	14·6	25–27	26·2 (5)

* Absent in 1 out of 6.

TABLE IV

Setae in lateral sternal brushes, ♀

		erythrocephali		*manipurensis*		*bhutanensis*		*singularis*	
		Range	Mean	Range	Mean (4)	Range	Mean	Range	Mean (10)
III	Anterior	0–1	0·5	0–1	0·2	4–7	5·2	2–5	3·5
	Marginal	2–4	3·1	1–4	2·2	3–5	4·7	4–5	4·3
	Total	2–5	3·6 (14)	1–4	2·5	7–12	9·8 (6)	7–10	7·8
IV	Anterior	7–12	9·8	5–6	5·2	10–12	11·0	6–11	9·0
	Marginal	5–7	5·8	5–6	5·8	6–8	7·0	6–7	6·3
	Total	14–17	15·6 (14)	10–12	11·0	17–19	18·0 (4)	13–17	15·3
V	Anterior	9–13	11·0	6–10	7·5	15–17	16·2	9–11	10·1
	Marginal	6–8	6·6	6	6·0	7	7·0	6–7	6·3
	Total	16–20	17·6 (12)	12–16	13·5	22–24	23·2 (4)	15–18	16·4
VI	Anterior	9–12	9·9	5–8	7·0	13–16	14·8	8–13	9·8
	Marginal	5–7	5·8	6	6·0	6–7	6·5	5–6	5·6
	Total	14–18	15·7 (10)	11–14	13·0	19–23	21·2 (4)	14–19	15·4
VII	Anterior	4–7	5·7	4–6	4·8	4–6	5·2	3–7	4·8
	Marginal	2–3	2·6	2–4	3·0	2–3	2·2	2–4	2·9
	Total	7–10	8·3 (10)	7–9	7·8	6–9	7·5 (4)	6–10	7·7

Figures in brackets denote sides.

TABLE V

Setae in lateral sternal brushes, ♀

		monilegeri		*assamensis*		*patkaiensis*		*orientalis*		*macraidoia*	
		Range	Mean (4)	Range	Mean (8)	Range	Mean (4)	Range	Mean (4)	Range	Mean (12)
III	Anterior	1–3	2·0	2–4	3·0	1	1·0	5–7	5·8	3–5	4·1
	Marginal	4–5	4·5	4–5	4·4	3–4	3·2	4–5	4·5	4–6	5·0
	Total	5–8	6·5	7–8	7·4	4–5	4·2	9–11	10·2	8–11	9·1
IV	Anterior	10–13	12·2	5–9	6·5	7–8	7·5	12–16	14·0	12–16	14·4
	Marginal	6–7	6·5	5–6	5·9	6–7	6·2	7–8	7·2	7–8	7·4
	Total	16–20	18·8	11–15	12·4	13–15	13·8	19–23	21·2	20–23	21·8
V	Anterior	11–17	13·8	8–11	9·2	11–13	12·2	17–21	18·2	15–18	16·4
	Marginal	7–8	7·2	6–7	6·4	7	7·0	7–9	8·0	7–9	7·9
	Total	18–24	21·0	14–17	15·6	18–20	19·2	25–28	26·2	23–26	24·3
VI	Anterior	12–14	13·0	6–11	8·1	8–11	9·5	15–19	16·8	9–15	11·8
	Marginal	6–7	6·2	5–7	5·9	5–6	5·8	6–8	7·5	6–7	6·4
	Total	18–20	19·2	12–18	14·0	14–17	15·2	23–27	24·2	15–22	18·2
VII	Anterior	3–6	3·8	2–4	2·8	1–3	2·0	6–7	6·2	5–8	6·1
	Marginal	2–3	2·8	1–3	2·2	2	2·0	3–4	3·2	3–4	3·2
	Total	6–8	6·5	4–6	5·0	3–5	4·0	9–10	9·5	8–12	9·3

Figures in brackets denote sides.

TABLE VI

Setae in lateral sternal brushes, ♂

		erythrocephali		*manipurensis*		*sikkimensis*		*bhutanensis*		*singularis*	
		Range	Mean	Range	Mean (8)	Range	Mean (4)	Range	Mean	Range	Mean (8)
III	Anterior	0–1	0·4	Absent		1–2	1·5	2–5	3·5	1–3	2·0
	Marginal	2–4	3·0	3–4	3·1	2–5	3·0	4–6	4·8	3–4	3·6
	Total	3–5	3·4 (16)			3–6	4·5	6–10	8·2 (8)	5–7	5·6
IV	Anterior	5–8	6·2	2–5	3·4	3–5	4·0	8–10	8·8	4–6	4·8
	Marginal	4–7	5·8	5	5·0	5–6	5·5	5–7	6·5	5–6	5·5
	Total	10–14	12·0 (10)	7–10	8·4	9–10	9·5	13–17	15·3 (6)	9–11	10·2
V	Anterior	7–10	8·1	5–7	5·5	6–9	7·5	12–17	13·5	4–6	5·0
	Marginal	5–7	6·2	5–6	5·6	5–6	5·2	6–8	7·0	5–6	5·5
	Total	13–16	14·3 (10)	11–12	11·1	11–14	12·8	18–24	20·5 (6)	9–12	10·5
VI	Anterior	5–7	6·4	5	5·0	6–7	6·2	12–14	13·0	4–6	4·6
	Marginal	5–6	5·2	4–5	4·9	5	5·0	5–7	6·2	5–6	5·2
	Total	10–13	11·6 (10)	9–10	9·9	11–12	11·2	18–21	19·2 (6)	9–11	9·9
VII	Anterior	2–4	2·8	2–3	2·1	1–4	2·8	4–6	5·0	2–4	3·0
	Marginal	2–3	2·9	3	3·0	2–3	2·2	3–4	3·5	2–4	3·2
	Total	5–7	5·7 (10)	5–6	5·1	3–6	5·0	8–10	8·5 (6)	6–7	6·2

Figures in brackets denote sides.

TABLE VII

Setae in lateral sternal brushes, ♂

		assamensis		*patkaiensis*		*orientalis*		*macraidoia*	
		Range	Mean (8)	Range	Mean	Range	Mean (10)	Range	Mean (12)
III	Anterior	2–4	3·0	0–3	1·5	3–4	3·5	4–7	5·4
	Marginal	4–5	4·4	4	4·0	4–6	5·2	4–7	5·4
	Total	6–8	7·4	4–7	5·5 (6)	7–10	8·7	9–13	10·8
IV	Anterior	5–8	6·6	6–8	7·0	10–13	11·4	10–17	14·3
	Marginal	6–7	6·4	5–6	5·7	6–8	7·1	6–8	7·1
	Total	12–15	13·0	12–14	12·7 (4)	17–20	18·5	17–25	21·4
V	Anterior	5–10	8·0	8–11	9·6	13–15	14·9	11–19	15·9
	Marginal	6–7	6·5	6–7	6·6	6–9	7·9	7–8	7·3
	Total	11–16	14·5	14–18	16·2 (5)	21–24	22·8	18–26	23·2
VI	Anterior	5–8	7·4	8–10	9·0	12–13	13·7	9–15	12·1
	Marginal	5–6	5·6	5–6	5·8	6–8	6·9	5–8	6·2
	Total	11–14	13	14–16	14·8 (6)	19–23	20·6	15–21	18·3
VII	Anterior	1–4	2·5	2–3	2·8	4–6	5·4	3–7	5·2
	Marginal	3–4	3·4	3	3·0	3–4	3·4	3–9	3·2
	Total	4–8	5·9	5–6	5·8 (6)	7–10	8·8	7–10	8·5

Figures in brackets denote sides.

INDEX

Myrsidea species

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PLATE 1

Myrsidea species

FIG. 55. *M. manipurensis*, ♂ head.
FIG. 56. *M. singularis*, ♀ head.
FIG. 57. *M. assamensis* from *G. leucolophus diardi*, ♀ head.
FIG. 58. *M. macraidoia* from type-host, ♂ genitalia.

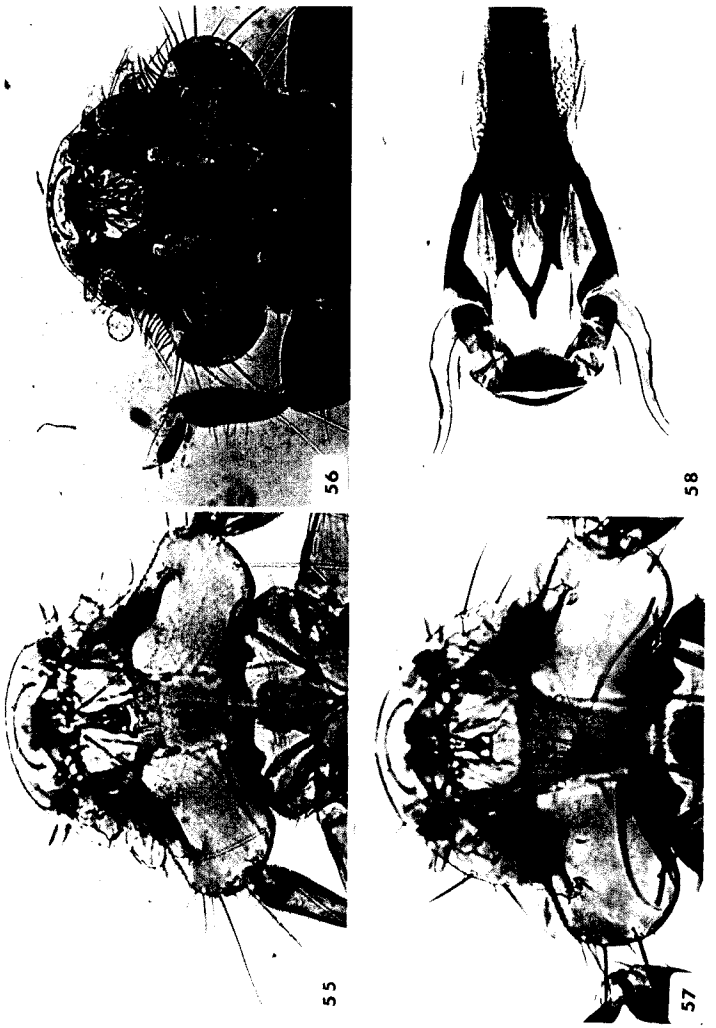

PLATE 2

Myrsidea species, ♂ genital sclerite

FIG. 59. *M. sehri*, allotype.
FIG. 60. *M. erythrocephali*.
FIG. 61. *M. sikkimensis*.
FIG. 62. *M. bhutanensis*.
FIG. 63. *M. assamensis* from *G. leucolophus belangeri*.
FIG. 64. *M. orientalis* from type-host.