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# Contributions towards a revision of *Myrsidea* Waterston. VI. (Phthiraptera, Amblycera: Menoponidae)

B. K. TANDAN* AND T. CLAY
*British Museum (Natural History)*

CONTENTS



With 1 plate and 45 text-figures

SYNOPSIS

This is part VI in the series of papers on *Myrsidea* and reviews the species parasitic on babblers of the genus *Turdoides*, subfamily Timaliinae (Aves). It includes re-descriptions of two known and descriptions of five new species. A key to the seven species, a host-parasite list and a note on host-parasite relationships are included.

## I INTRODUCTION

This paper deals with species of *Myrsidea* Waterston, 1915 (Menoponidae) parasitic on babblers of the genus *Turdoides* Cretzschmar and is based on material in the British Museum (Natural History) collection (BMNH) and that provided by Dr. K.C.Emerson (E.C.). Hitherto only four species of *Myrsidea* have been described from the Timaliinae (family Muscicapidae), all by Ansari (1951), three of which are valid, two being parasitic on *Turdoides*.

* Permanent address: Department of Zoology, University of Lucknow, Lucknow, India.

## II TAXONOMIC CHARACTERS OF *Myrsidea* INFESTING *Turdoides*

The generic characters of *Myrsidea* are given in Clay (1966 : 330–332; also see Clay, 1969), and these, together with any of the characters discussed below that are common to all the species dealt with in this paper, will not be included in the specific descriptions.

### *Head*

Of same general shape (Plate I, figs. 1–3); differences shown by measurements (Tables 7, 8). Basically head chaetotaxy as in *thoracica* (see Clay, 1966, fig. 1). Gular setae normally 4 + 4, individual variation of total number in female 6, 7 or 9 and in male 6 or 7. Antenna as in Clay (1966 : 338 and fig. 2). Relative proportions of pair of setae on maxillary palp as in *thoracica* (fig. 1 in Clay, 1966).

### *Thorax*

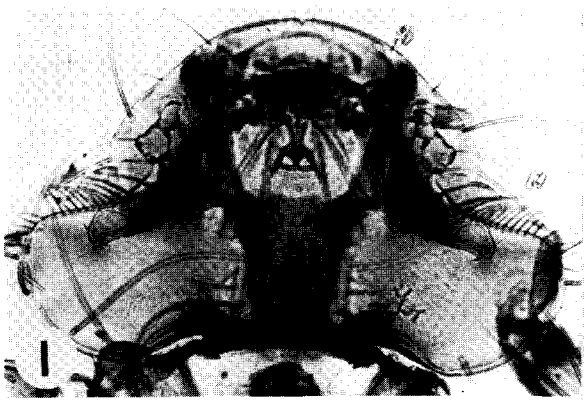
Pronotum with 3 + 3 spiniform anterolateral setae and 3 + 3 long and stout setae on posterior margin, with an occasional specimen having 4 + 3 or 3 + 4 long setae. Mesonotum undivided. Metanotum normal or modified, with 1 + 1 long posterolateral setae (not included in setal counts) and usually 2 + 2 posterior marginal setae in female; in male, number of marginal setae varies. Metapleural setae short and spiniform; in female their number varies between 3–6 each side (one of *bharat* sp. n. had 3 + 2), but in male 2 + 2 tends to be the constant number. First tibia with 3 + 3 outer ventrolateral and a varying number of dorsolateral setae.

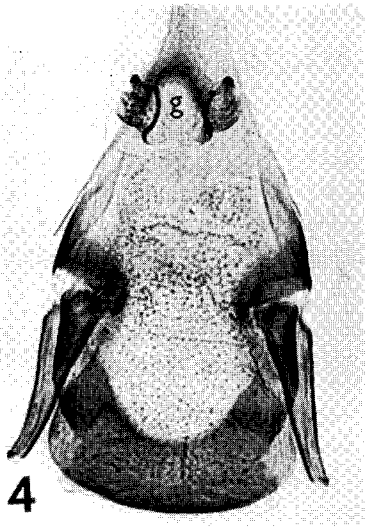
### *Abdomen*

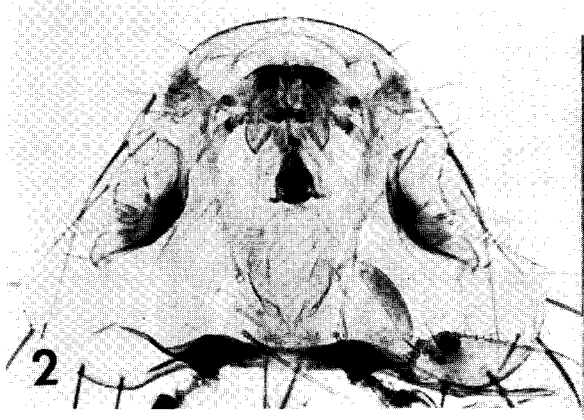
Sternites slightly more heavily pigmented than tergites. In female, anterior terga normal or modified and extent of their modification reflected by curvature of line of marginal setae. Spiracles on tergites. Edge of vulva strongly serrate, central serrations sometimes less pronounced than lateral ones. Microtrichia or comb-like projections of inner surface of genital chamber basically as in figure 31, but in some species the projections may be shorter or the "comb" may be wider or narrower across, or both.

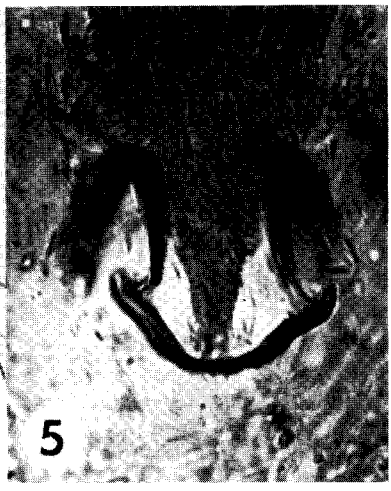
The male genitalia are of the typical *Myrsidea* type, the shape of the endomeral plate and parameres being constant (Plate I, fig. 4). The genital sclerite is small and of two distinct types (figs. 32, 39). It is composed of a flat plate with two sclerites associated with its posterior end. The plate, being feebly sclerotised, has, even in well preserved specimens, a faint outline, so that its interspecific comparison is not always possible, and the sclerites associated with it posteriorly, being small, get easily distorted. In *satbhai* Ansari and *bharat* sp. n. it was not possible to interpret the exact structure of the sclerites, so that the figures are only approximations. Although in the *chilchil* species-group the details could be delineated, in no two specimens did the posterior sclerites appear identical—the difference probably being more of an artefact than due to individual variation (compare figs. 36, 37).

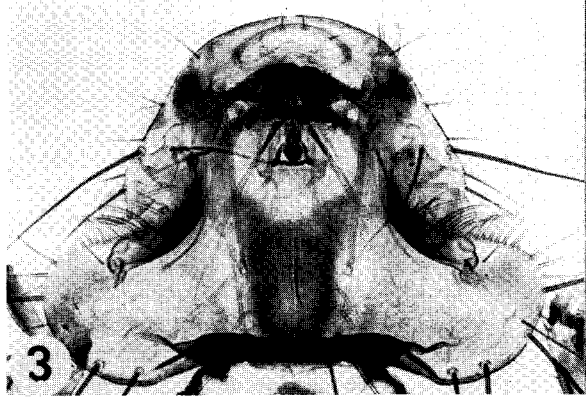
The structure homologous with the bursa copulatrix of the Icterid-infesting species (Clay, 1968 : 207) is a trilobed sac (Plate I, fig. 6). Although often considerably crumpled in mounted specimens, the shape and form of the bursa are sufficiently constant to make it a feature characteristic of all the *Myrsidea* species from *Turdoides*; in fact, the only one which is so.



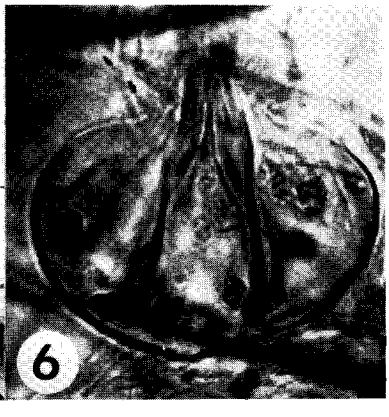




PLATE I

**Fig. 1.** *Myrsidea satbhai*, from type host, ♀, head.
**Fig. 2.** *Myrsidea salimalii*, ♀, head.
**Fig. 3.** *Myrsidea meinertzhageni*, from type host, ♀, head, holotype.
**Fig. 4.** *Myrsidea satbhai*, from *T. striatus somervillei*, male genitalia; *g*, genital sclerite.
**Fig. 5.** *Myrsidea clamosae*, from type host, male genital sclerite.
**Fig. 6.** *Myrsidea chilchil*, from type host, bursa copulatrix.

A long bottle-shaped spermatophore has been seen in almost all the species, either inside the male abdomen or associated with dissected male genitalia. Just as in one female *Myrsidea* from Icterid hosts a spermatophore was seen (Clay, 1968 : 207), only one female (of *breviterga* sp. n.) from *Turdoides* was found to have a spermatophore in the abdomen close to the bursa. Such isolated instances are proofs, if proof is required, that the spermatophore is transferred to the female and soon after serving its function disintegrates.

*Chaetotaxy of the abdomen*

Post-spiracular setae III and V always considerably shorter and finer than II and IV, III being slightly longer (Table 9). Last tergum with 1 + 1 inner posterior moderately long to long setae; individual specimens may have 2 + 2, 2 + 1, 1 + 0 or 1 + 3 setae. Male with 4, occasionally 5, fine setae on posterior margin of abdomen and 8 (rarely 7, 9 or 10) internal "anal" setae.

Segments I–VII with short, spiniform, marginal pleural setae, with an occasional slightly anterior one ventrally on IV–VII. Pleurite VIII always with 3 + 3 setae (see Clay, 1966 : 339 and figs. 9–19), central one always long and stout but length of outer (*o*) and inner (*i*) ones relative to each other varies (figs. 1, 24); besides these 1–2 usually short setae may be present on one or both sides inner and anterior to inner seta. On segments II–VII, 2–4 of inner, ventral pleural setae usually finer than outer ones, difference being more marked in female. Sternite I without setae. Sternum II with one of the more lateral setae of marginal row sometimes out of line, or even quite anterior to row. Sternum III with variable chaetotaxy. Sternites IV–VI in female and IV–VII in male with anterior central setae in addition to line of marginal setae. On anterior sternites, marginal setae form a distinct row, but on sternite VII in female and sternites VII and VIII in male it is sometimes difficult to separate marginal from anterior setae because of unevenness of marginal row. Sternite III with incipient, and sternites IV–VII with distinct, lateral brushes of setae, those on IV–VI being dense. Definite line of setae, setae anterior to line, and sparse lateral brushes of setae, posterior to sternum VI in the female and VII in the male, are regarded as belonging to sternum VII and VIII, respectively; remaining posterior setae, excepting those of vulval margin in female, as those of genital region (figs. 1, 2). In male 1 + 1 posterolateral setae on sternite VIII, and in both sexes 2 + 2 (in one female of *clamosae* 2 + 3) setae in genital region, separable from all others in being longer and stouter, especially 1 + 1 outer ones of latter. Vulval marginal setae often arranged unevenly, when it becomes difficult to separate them from more posterior setae of genital region.

The abdominal setae listed below are found in all the species dealt with here and have therefore been omitted from the setal counts given in the text, key and tables (the posterior ones are shown with blackened alveoli in figs. 23, 27): 1 + 1 anterolateral spiniform on tergite I; 1 + 1 post-spiracular on I–VIII and the associated spiniform of the post-spiracular setal complex (Clay, 1970) on II–VIII; 1 + 1 (moderately long to long) on tergum IX; in the male 2 + 2 fine and short on posterior margin of the abdomen; 3 + 3 on pleurite VIII; 2 + 2 anterolateral (spiniform or short) on sternite II; 1 + 1 posterolateral on sternite VIII in the male and 2 + 2 in the genital region of both sexes; 3 + 3 terminal setae, the 2 + 2 outer and relatively dorsal ones being probably pleural.

## III SPECIES DESCRIPTIONS

The following specific descriptions and measurements are on the same lines as those followed by Clay (1966, 1968), except for certain minor differences. Since in these species the lateral brushes of the setae on sternites IV–VI are dense and distinct, the setae comprising the brush have been separated from the remaining setae, and the latter have been referred to as central setae (Tables 1–3). Those central setae near the posterior intersegmental suture are called the marginal setae, and the rest the anterior setae. The posterior setae of the brush, which together with the marginal setae form a continuous row, differ in proportions from the central marginal ones (as also from the anterior ones of the brush), and being readily separable have been given separately in Tables 4–6.

### (1) The *satbhai* species-group

The first two species, *satbhai* Ansari and *bharat* sp. n., have the following characters in common: Hypopharynx fully reduced; marginal metanotal setae average more than 6 in male; metasternal setae normally 5–7 in male and 6–8 in female, of which 1 + 1 are anterior and 2 + 2 (range 3–5 in male and 4–6 in female) posterior and near lateral margins of plate (fig. 19). Proportions of post-spiracular seta VI approximately the same as VII and VIII or sometimes slightly shorter and thinner. In female, sternite II with more than 14 marginal setae; sternum III with anterior median setae and 12 or more marginal setae; row of marginal vulval setae usually without median gap. Male pleurite VIII with or without an extra seta (referred to as v) on one or both sides. Male genital sclerite with flat plate narrow anteriorly, dividing posteriorly into two lateral arms; associated sclerites characteristic (Plate I, fig. 4; fig. 32).

#### *Myrsidea satbhai* Ansari, 1951

(Plate I, fig. 1,; figs. 1, 2, 11, 12, 19, 21–33)

Type host: *Turdoides s.striatus* (Dumont)

*Myrsidea satbhai* Ansari, 1951: 178, fig. 20. Host: *Turdoides t.terricolor* = *Turdoides s.striatus*.

This is the second species of *Myrsidea* to be described from the Timaliinae and resembles the next new species, *bharat*, the distinguishing characters of the two being given under the latter species.

*Female and male* (from type host)

Head seta 10 usually approximately same length as 11, but sometimes, especially in males, 10 is somewhat shorter. Posterior metanotal setae: female—2 + 2 (6), 3 + 2 (1), each side outer moderately long to long, inner very long; male—6–9, $\bar{x}$ 7·57 (7). Metapleural setae: female—3–5, $\bar{x}$ 3·93 (16 sides); male—2 + 2 (6), 5 (1). Outer dorsal setae of tibia I: female—9–16 (holotype 12 + 13), $\bar{x}$ 12·43 (14 tibiae); male—8–13, $\bar{x}$ 10·61 (13). Setae of femoral brush: female— 29–41 (holotype 35 + 36), $\bar{x}$ 35·09 (11 femora); male—25–34, $\bar{x}$ 29·08 (12).

*Abdominal chaetotaxy* (figs. 1, 2).—Tergal setae: female—I, 2–3, $\bar{x}$ 2·14 (7); II, 8–10, $\bar{x}$ 8·85 (7); III, 11–13, $\bar{x}$ 11·50 (6); IV, 13–15, $\bar{x}$ 13·50 (6); V, 10–15, $\bar{x}$ 12·57 (7);

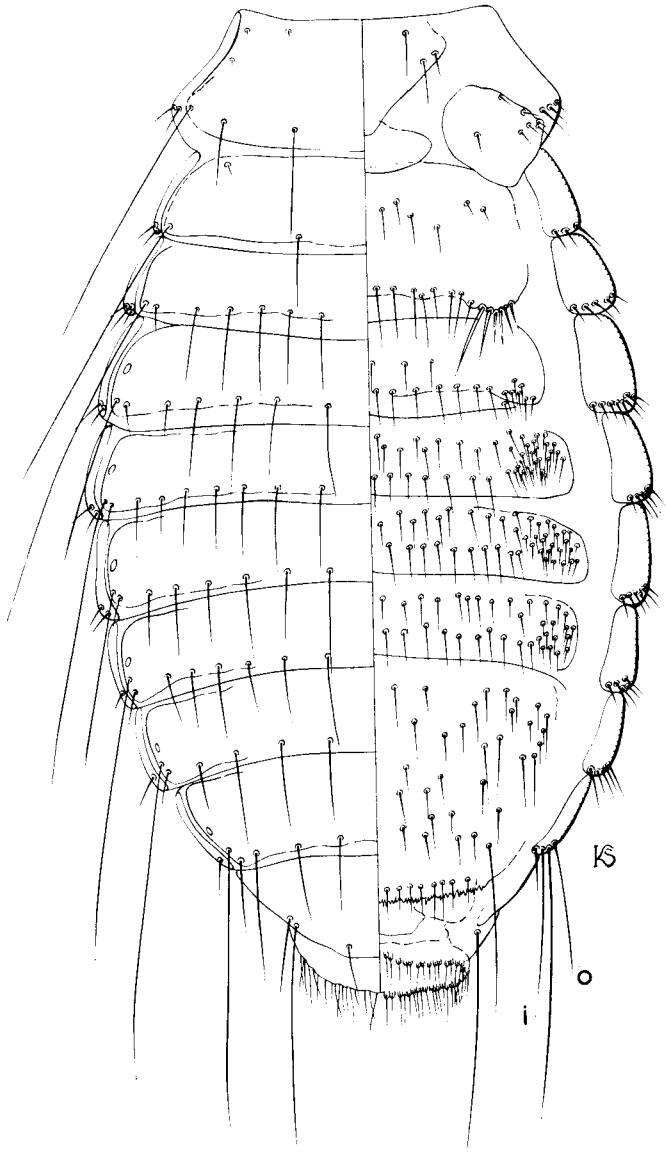



**Fig. 1.** *Myrsidea satbhai*, ♀, from type host. *i*, inner seta; *o*, outer seta.

VI, 10–13, x̄ 11·57 (7); VII, 9–11, x̄ 9·71 (7); II–VII, total 66–74, x̄ 68·17 (6); VIII, 6–7, x̄ 6·28 (7); male—I, 9–11, x̄ 10 (6); II, 13–14, x̄ 13·20 (5); III, 15–17, x̄ 16·40 (5); IV, 14–18, x̄ 16·20 (5); V, 14–21, x̄ 18·20 (5); VI, 14–18, x̄ 16 (6); VII, 11–17, x̄ 13 (6); VIII, 7–11, x̄ 8·50 (6); I–VIII, total 109–124, x̄ 116·25 (4). Pleural setae: female—I, 4–5, x̄ 4·40 (10 sides); II, 7–9, x̄ 8·10 (10); III, 8–10, x̄ 9·10 (10); IV, 7–9, x̄ 8·33 (12);

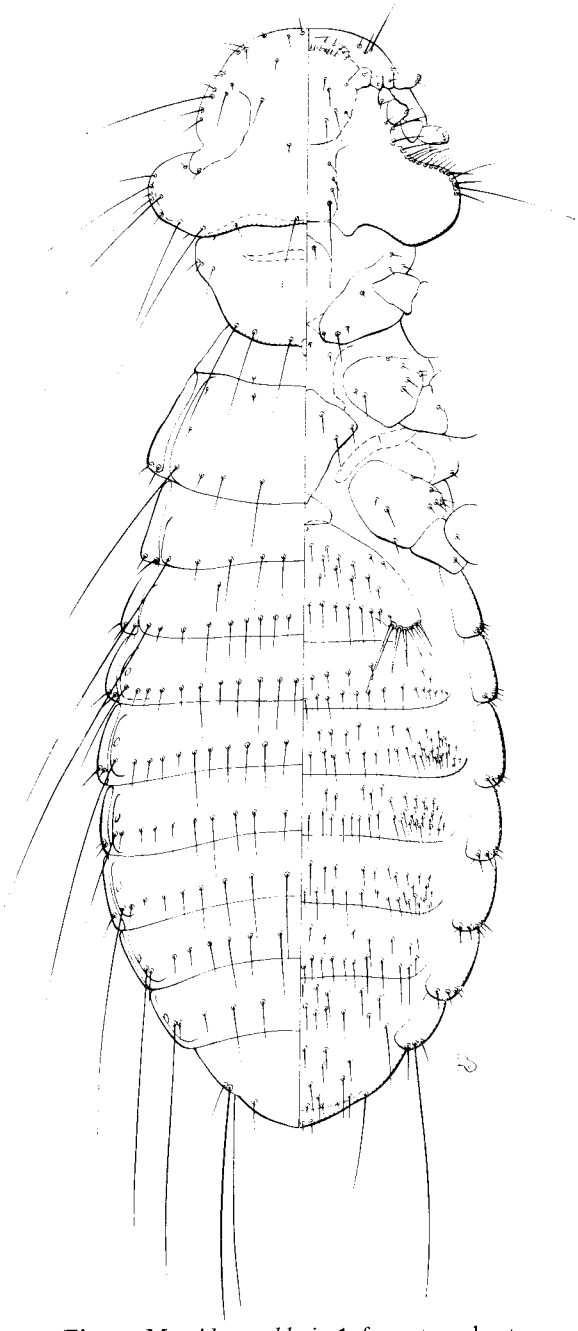


**Fig. 2.** *Myrsidea satbhai*, ♂, from type host.

V, 7–8, x̄ 7·83 (12); VI, 5–8, x̄ 6·00 (12); VII, 5–6, x̄ 5·66 (12); VIII, seta v short to moderately long, 1–2, total 2–3, seta *o* long to very long and *i* long, *o* usually longer than *i*; male—I, 2–5, x̄ 3·33 (10); II, 6–8, x̄ 6·91 (12); III, 7–9, x̄ 7·50 (14); IV, 6–8, 6·93 (14); V, 6–8, x̄ 6·71 (14); VI, 5–7, x̄ 6 (14); VII, 4–5, x̄ 4·50 (14); VIII, seta v ml,

0 + 1 (1 out of 6), seta *o* moderately long to long, *i* long and longer than *o*. Sternal setae: female—II–VII, Tables 1, 4; on II in holotype, anterior 5, marginal 17; genital region, 19–29, $\bar{x}$ 23·28 (7); vulval marginal, 15–20, $\bar{x}$ 17·85 (7); anal corona, ventral 38–48 ($\bar{x}$ 43·14), dorsal 37–46 ($\bar{x}$ 40·57), total 78–94, $\bar{x}$ 83·71 (7); male—II–VIII, Tables 2, 5; genital region, 11–18, $\bar{x}$ 14·87 (7). Setae in aster: 5–7 (female, total 11–14 (holotype 7 + 7), $\bar{x}$ 6·35 (14 asters) and male, total 10–13, $\bar{x}$ 5·85 (14)).

*Material examined*

From the type host *Turdoides s.striatus*. Holotype ♀, allotype ♂, paratypes 4 ♀, 3 ♂ and 1 nymph of *Myrsidea satbhai*, PAKISTAN: Panjab, 16.iii.1932; NEPAL: 3 ♂, iii.1937 (*R.Meinertzhagen*, 9370); INDIA: Rajputana and U.P., 5 ♀, 3 ♂, 4.i.1952 (*R.Meinertzhagen*, 13345, 19676). From *Turdoides striatus sindianus* (Ticehurst), PAKISTAN: Sind, 7 ♀, 2 ♂, i.1937 (*R.Meinertzhagen*, 10391). From *Turdoides striatus somervillei* (Sykes), 5 ♀, 6 ♂, INDIA: Bombay, ii.1937 (*R.Meinertzhagen*, 8443) and Lucknow (*B.K.Tandan*, 10). All in BMNH. From *Turdoides striatus* (Dumont), INDIA: Aurangabad, 1 ♀, 5 nymphs, vii.1968 (B 5593–9E 0249, B 5597–9E 0256, B 5611–9E 0258); E.C.

Ten females and three males from *Turdoides melanops vepres* Meinertzhagen, a babbler found in Kenya, are similar to the available specimens of *satbhai* from *Turdoides striatus*, but differ in the following characters: (i) head seta 10 distinctly shorter than 11 (fig. 13); (ii) a larger number of setae in the aster (female, 7–8, $\bar{x}$ 7·15 (20 asters); male, 6–7, $\bar{x}$ 6·17 (6)) and in the genital region (female 23–34, $\bar{x}$ 31 (7); male, 19 (3)); (iii) a smaller number of tergal setae in the male (I–VIII, $\bar{x}$ 106·5 (2)), outer dorsolateral setae of tibia I (female, 6–8, $\bar{x}$ 7·30 (20 tibiae); male, 6–7, $\bar{x}$ 6·50 (6)), and setae in the brush on femur III (female, 26–34, $\bar{x}$ 30·70 (20 femora); male 22–28, $\bar{x}$ 24·33 (6)); (iv) shorter post-spiracular setae (Table 9) and seta v in the female. The average of central sternal setae on III and IV is smaller but the range on IV shows some overlap (Tables 1, 2) and the number of setae in the brush is smaller on III and IV and greater on VII in the female (Table 4) and is smaller on III–V in the male (Table 5). In the female the number of tergal setae (II–VII, total 66–70, $\bar{x}$ 68·25 (8)) agrees closely with that of specimens from *T.striatus*, and in the available material the anterior terga of the abdomen do not appear to differ noticeably; the male genital sclerite (fig. 35), although smaller, seems to be the same as that of *satbhai*. Provisionally these specimens have been included in *satbhai* sens. lat.

*Material examined.*—From *Turdoides melanops vepres* Meinertzhagen, KENYA: 10 ♀, 3 ♂, i.1936 and iii.1949 (*R.Meinertzhagen*, 6169, 6170, 18827), in BMNH. The individuals from which these specimens of *Myrsidea* were collected form the type-series of *vepres*.

## **Myrsidea bharat** sp. n.

(figs. 3, 14, 34)

Type host: *Turdoides malcolmi* (Sykes)

This species is distinguished from *satbhai* in the female by the slightly enlarged tergum I, in the male by the details of the genital sclerite, in combination with features of the chaetotaxy of both sexes (Tables 1, 2, 4, 5). Characters in which *bharat* resembles *satbhai* (see above) are not repeated here.

*Female and male*

Head seta 10 approximately as long as 11 or somewhat shorter. Posterior metanotal setae: female—$\bar{x}$ 4·33 (12); male—$\bar{x}$ 7·37 (8). Metapleural setae: female—$\bar{x}$ 3·44 (50 sides); male—2 + 2 (5), 5 (2). Outer dorsal setae of tibia I: female—$\bar{x}$ 12·13 (30 tibiae); male—5–12, $\bar{x}$ 9·85 (14). Setae of femoral brush: female—28–35, $\bar{x}$ 30·37 (32 femora); male—19–29, $\bar{x}$ 25·76 (14), average less than in *satbhai*.

*Abdominal chaetotaxy* (fig. 3).—Tergal setae: female—II–VII, total 67–100, $\bar{x}$ 83·50 (12), average higher than in *satbhai*; VIII, 6–8, $\bar{x}$ 6·66 (12); male—II, 13–17, $\bar{x}$ 15·71 (7); VIII, 8–10, $\bar{x}$ 9·66 (6); I–VIII, total 110–126, $\bar{x}$ 119·86 (7). Pleural setae: female—II, 6–8, $\bar{x}$ 6·94 (16 sides); III, 7–11, $\bar{x}$ 8·37 (16); VIII, seta v short to moderately long, 0–1, total 1–2, seta *o* moderately long to just long, *i* long and longer than *o*; male—I, 3–6, $\bar{x}$ 4·21 (14); VIII, seta v short to moderately long, 1–2 (2 out of 7), seta *o* short to moderately long, *i* moderately long to long and longer than *o*. Sternal setae: female—II, aster, $\bar{x}$ 6·40 (32 asters); II–VII, Tables 1, 4; vulval marginal, 11–18, $\bar{x}$ 13·66 (6); male—II, aster, $\bar{x}$ 6·36 (14); II–VIII, Tables 2, 5; genital region, 10–19, $\bar{x}$ 15 (5).

*Material examined*

From *Turdoides malcolmi* (Sykes): 24 ♀, 7 ♂, INDIA: Rajputana, i.1936, 6.i.1952 and Deccan, ii.1937 (*R.Meinertzhagen*, 4779, 8528–30, 8551, 19698), BMNH; INDIA: Hyderabad, 2 ♀, 3 nymphs, 31.vii.1968 (B 5892, 9E 0254), E.C

*Holotype* ♀, from the type host, INDIA: Rajputana, Bharatpur, 6.i.1952 (*R.Meinertzhagen*), slide no. 19698a, in BMNH.

*Paratypes* 25 ♀, 7 ♂, from the same host species with data as given above, BMNH and E.C.

*Bharat*, the name given to this species, is the Sanskrit (mythological) name for India.

One female of this species deserves special mention: the spiracle, tracheal trunks and post-spiracular setal complex (see Clay, 1970 : 82) on one side of segments III–VIII are abnormal, and their condition is tabulated below:

| | | | Setae of post-spiracular setal complex | | |
|---|---|---|---|---|---|
| Segment | Tracheal trunk | Spiracle | Post-spiracular | Associated spiniform | Associated minute |
| III | absent | absent | subnormal | absent | normal |
| IV | absent | absent | subnormal | absent | normal |
| V | absent | subnormal | normal | absent | normal |
| VI | absent | subnormal | broken | absent | normal |
| VII | absent | absent | subnormal | normal | normal |
| VIII | anterior trunk present | subnormal | stunted | normal | normal |

It seems that either failure of the spiracles to develop led to the loss or atrophy of the post-spiracular seta and the associated spiniform seta of the post-spiracular setal complex, or the latter was responsible for the former. Whatever may have been the cause, parallel reduction or absence of the spiracle and elements of the post-spiracular setal complex is indicative of a functional relationship between these structures, as has been recently suggested by Clay (1970).

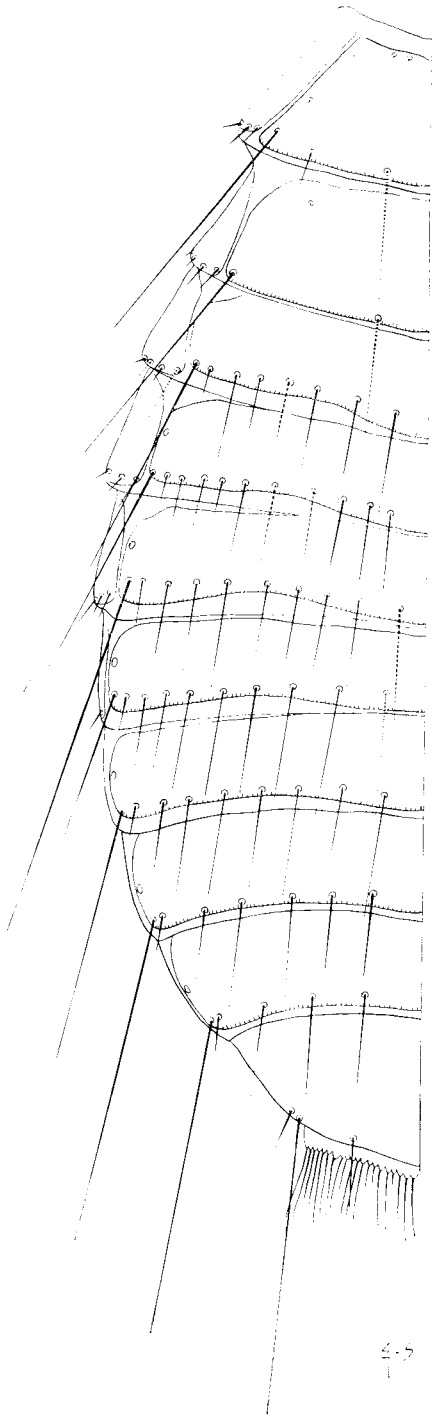


**Fig. 3.** *Myrsidea bharat*, ♀, holotype, dorsal.

## (2) The *chilchil* species-group

This group comprises five species *chilchil* Ansari, *salimalii* sp. n., *breviterga* sp. n., *meinertzhageni* sp. n. and *clamosae* sp. n., with the following characters in common: Hypopharynx never fully reduced; metanotal setae in the male 2 + 2 or average below 5; metasternal setae normally 6–11, of which 1 + 1 (rarely 3 or 4) are anterior and 4–8 in female and 4–9 in male posterior and near lateral margins of plate (figs. 20–22). In female, sternite II with fewer than 12 marginal setae; sternum III without anterior median setae and 11 or fewer marginal setae; row of marginal vulval setae usually with a median gap. Male pleurite VIII without extra seta v. Post-spiracular seta VI slightly or considerably shorter than VII, difference being more marked in male than in female.

In these species, except *breviterga*, there is much intraspecific variation in the proportions of post-spiracular seta VI. In the female it is always longer than V, but in some males it is shorter than that seta, which is an unusual condition (Table 9). In the female this seta may occasionally be abnormally long on one or both sides of the body. In one male of *chilchil* sens. lat. from *Turdoides s.squamiceps*, post-spiracular setae IV–VI are subnormal on the right hand side, those of IV and VI being consderably shorter and thinner than those of the other side, and that of V spiniform like the adjoining spiniform seta. The length of such post-spiracular setae has not been included in the measurements given in Table 9.

In the male genital sclerite the flat plate is broad and rounded anteriorly, tapering posteriorly to a rather blunt end, with the two associated sclerites differing from those of *satbhai* and *bharat* (fig. 39; Plate I, fig. 5). Each of these sclerites can be divided into two parts: (i) a posterior horizontal arm which is usually curved, having its inner end associated with the flat plate and (ii) a vertical arm arising from the outer end of (i). The horizontal arm is basically similar, but the vertical one shows considerable interspecific differences (figs. 36–45).

### *Myrsidea chilchil* Ansari, 1951

(Plate I, fig. 6; figs. 4, 5, 15, 36, 37)

Type host: *Turdoides c.caudatus* (Dumont)

*Myrsidea chilchil* Ansari, 1951: 181, fig. 21. Host: *Argya c.caudata* = *Turdoides c.caudatus*.

*Myrsidea lyallpurensis* Ansari, 1951: 185, fig. 23. Host: *Acridotheres t.tristis* (Linn.) [error] **syn. n.**

*Female and male* (from type host)

Hypopharynx slightly reduced. Vertical arm of the male genital sclerite characteristically curved to form a ventral arm with a pointed apex. Head seta 10 almost as long as 11 or significantly shorter in the female and in some males. Female metanotum slightly but perceptibly enlarged. Posterior metanotal setae: female—2 + 2 (6), 5 (2), $\bar{x}$ 4·25 (8); male—2 + 2 (6). Metapleural setae: female—3–6, $\bar{x}$ 5 (20 sides); male—2 + 2 (5), 5 (1). Outer dorsal setae of tibia I: female—9–17 (holotype 12 + 11), $\bar{x}$ 12·85 (20 tibiae); male—9–14, $\bar{x}$ 11·75 (8). Setae of femoral brush: female—28–35 (holotype ? + 29), $\bar{x}$ 30·70 (16 femora); male—23–30, $\bar{x}$ 27 (6).

*Abdominal chaetotaxy* (figs. 4, 5).—Tergal setae: female—I, 12–18, x̄ 14 (4); II, 10–20, x̄ 14·80 (5); III, 12–18, x̄ 15·20 (5); IV, 13–17, x̄ 15 (5); V, 17–19, x̄ 18 (5); VI, 16–19, x̄ 17·75 (4); VII, 15–17, x̄ 15·50 (4); VIII, 9–12, x̄ 10·80 (5); I–VIII, total 110–134, x̄ 126·20 (5); male—I, 7–10, x̄ 8·40 (5); II, 8–14, x̄ 10·50 (4); III, 9–13, x̄ 11·25 (4); IV, 11–15, x̄ 12·25 (4); V, 11–15, x̄ 13·66 (3); VI, 13–15, x̄ 14 (5); VII, 11–12, x̄ 11·25 (4); VIII, 4–7, x̄ 5·60 (5); I–VIII, total 78–90, x̄ 85·33 (3). Pleural setae: female (mean of 10 sides)—I, II, 7–9, x̄ 8·10, 8·20; III, 8–12, x̄ 9·30; IV, 8–10, x̄ 9; V, 7–10, x̄ 8·50; VI,

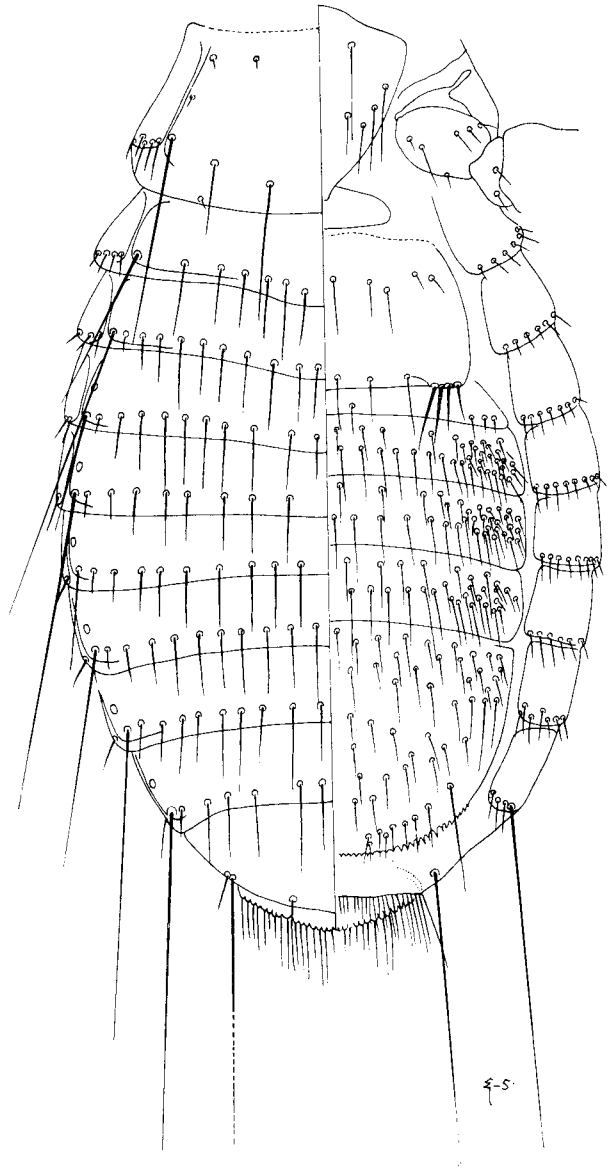


**Fig. 4.** *Myrsidea chilchil*, ♀, from type host.

7–8, $\bar{x}$ 7·70; VII, 7–8, $\bar{x}$ 7·30; VIII, seta v, 0–2, total 1–4, setae *o* and *i* short to moderately long but *o* usually slightly longer; male—I, 3–5, $\bar{x}$ 4·25 (8 sides); II, 6–8, $\bar{x}$ 6·44 (9); III, IV, 6–8, $\bar{x}$ 6·66 (9); V, 5–7, $\bar{x}$ 5·66 (9); VI, 5–6, $\bar{x}$ 5·33 (9); VII, 4–5, $\bar{x}$ 4·33 (9); VIII, seta *o* moderately long, *i* short to moderately long, seta *o* slightly longer or shorter than *i*. Sternal setae: female—II–VII, Tables 1, 4; on II in holotype, anterior 4, marginal 7; aster 4–6 (holotype 5 + 4), $\bar{x}$ 4·65 (20 asters); VII, total 38–52, $\bar{x}$ 43·43 (7); genital region, 15–27, $\bar{x}$ 22 (7); vulval marginal, 15–17 (holotype 7 + 8), $\bar{x}$ 16 (10); anal corona, ventral 33–34 ($\bar{x}$ 37·37), dorsal 34–43 ($\bar{x}$ 39·50), total 68–87, $\bar{x}$ 76·87 (8); male—II–VIII, Tables 2, 5; II, aster 4–5, $\bar{x}$ 4·66 (9); VII, total 23–33, $\bar{x}$ 28·25 (4); genital region 5–14, $\bar{x}$ 8·75 (4).

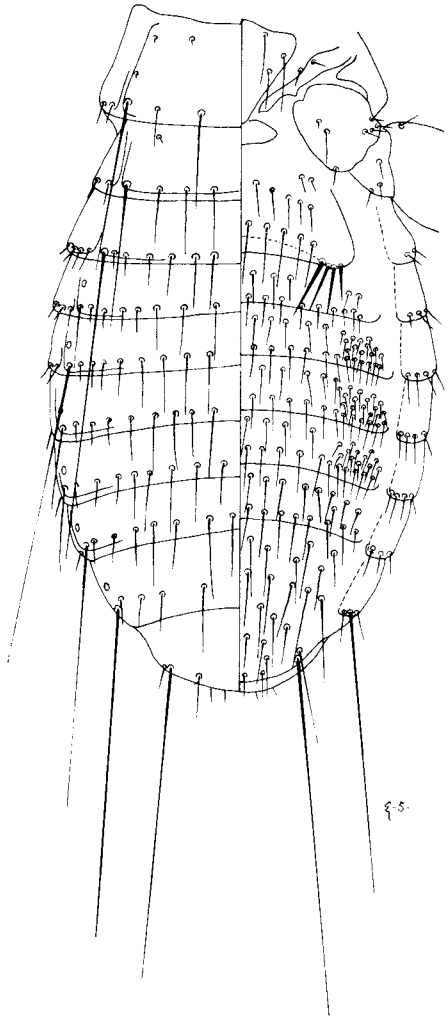


**Fig. 5.** *Myrsidea chilchil*, ♂, from type host.

*Material examined*

From the type host *Turdoides c.caudatus*. Holotype ♀, allotype ♂, paratypes 1 ♀, 1 ♂ (dissected) and 1 nymph of *Myrsidea chilchil*, PAKISTAN: Lyallpur, Panjab, 27.ii.1936, BMNH No. 1953–2; 12 ♀, 3 ♂ (1 dissected), PAKISTAN: Peshawar, iii.1937 and Sind, i.1937 (*R.Meinertzhagen*, 9501, 9445, 10403); 5 ♀, 3 ♂, 1 nymph, INDIA: Rajputana, iii.1937 and Indore, 1939 (*R.Meinertzhagen*, 8922, 13551); BMNH. From *Turdoides squamiceps yemensis* (Neumann), ADEN: 2 ♂, xi.1948 (*R.Meinertzhagen*, 17748), BMNH. From *Turdoides s.squamiceps* (Cretzschmar), ARABIA: 1 ♀, 4 ♂, i.1948 (*R.Meinertzhagen*, 17108, 17189), BMNH. From *Turdoides squamiceps* (Cretzschmar), ISRAEL: Yatnata, 5 ♀, 8 ♂, 27.i.1968 (A–36, A–39), E.C.; PALESTINE: Jericho 1 ♀, 4 ♂ (2 dissected), 1 nymph, i.1922 and 24.xi.1922, BMNH.

Holotype ♀, allotype ♂, paratype 1 ♀ of *Myrsidea lyallpurensis* from *Acridotheres t.tristis* (L.), PAKISTAN: Lyallpur, 16.vi.1931, BMNH No. 1953–2. These specimens agree with *chilchil* from the type host and are presumably stragglers from *Turdoides*.

The specimens from *Turdoides squamiceps* agree with typical *chilchil* in the characters of the hypopharynx, the female metanotum and tergites and male genital sclerite (fig. 38), but they are on average rather larger (Tables 7, 8), and head seta 10 is shorter to slightly longer than 11 in both sexes (fig. 16). In the female the number of taxonomically important setae falls within the range of specimens from *T.c.caudatus*, only the range and number of marginal setae on sternum II is slightly greater (8–9, $\bar{x}$ 8·66 (3)). In the male the range and average of certain setae show some differences: Tergal setae: I–VIII, total 85–99, $\bar{x}$ 92·33 (3). Sternal setae: II, anterior 9–15, $\bar{x}$ 13 (4), marginal 9–13, $\bar{x}$ 11 (5); aster, 3–5, $\bar{x}$ 4·30 (10); genital region, 7–16, $\bar{x}$ 10·33 (6). The lengths of the post-spiracular setae are similar, excepting that of VI which is longer (Table 9). It has already been remarked that post-spiracular seta VI shows considerable variation within the species and therefore its length is not taxonomically important. Owing to the absence of significant taxonomic differences, specimens from *Turdoides squamiceps* have been included in *chilchil* sens. lat.

## **Myrsidea salimalii** sp.n.

(Plate I, fig. 2; figs. 6, 20, 39, 40)

Type host: *Turdoides earlei* (Blyth)

This new species is distinguished from *chilchil* in both sexes by the fully developed hypopharynx, in the female by the greatly enlarged metanotum which has only 1 + 1 setae, and in the male by the details of the chaetotaxy and genital sclerite of which the vertical arm is diagnostic. Characters as in *chilchil* not repeated.

*Female and male*

Hypopharynx fully developed. Head seta 10 somewhat shorter than 11 the male showing more variability in the length of 10. Female metanotum greatly enlarged. Vertical component of male genital sclerite (fig. 40, *ve. a.*) resembles ventral arm of this sclerite in *breviterga* and *clamosae* and is therefore considered to be the homologue of the latter (this is possibly a derived condition, due to a reduction of the portion of the vertical arm lying between the horizontal arm and the ventral arm (figs. 41, 44) resulting in the latter's becoming vertical (fig. 40)). Posterior metanotal setae: male—2 + 2 (5); female—

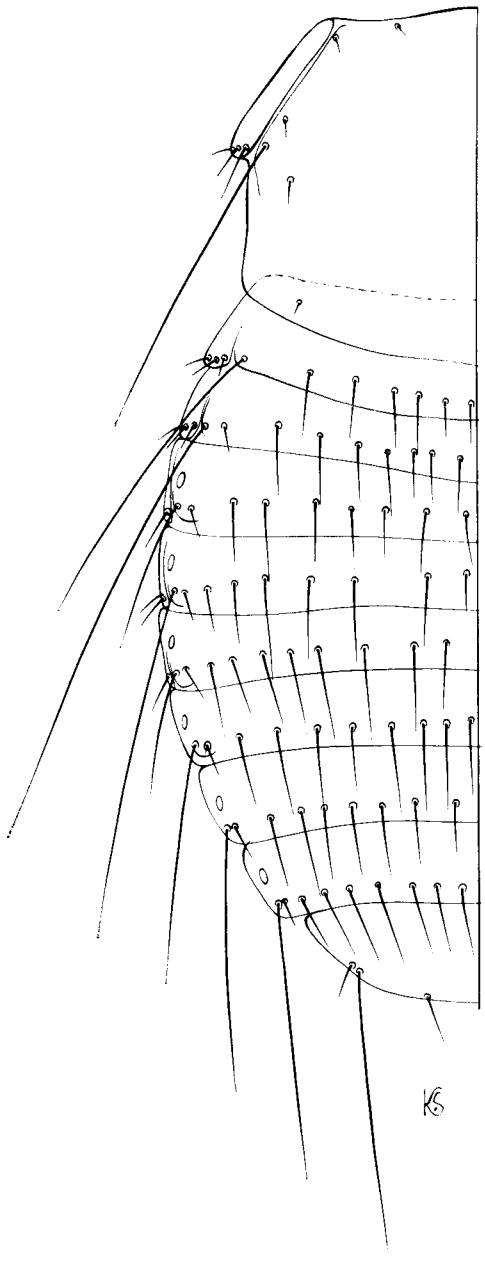


**Fig. 6.** *Myrsidea salimalii*, ♀, holotype, dorsal.

1 + 1 as only short outer ones present. Metapleural setae: female—3–6, $\bar{x}$ 3·88 (18 sides); male—2 + 2 (5). Outer dorsal setae of tibia I: female—8–12, $\bar{x}$ 9·93 (16 tibiae); male—7–13, $\bar{x}$ 9·80 (10). Setae of femoral brush: female—27–32, $\bar{x}$ 28·46 (15 femora); male—22–27, $\bar{x}$ 24·30 (10).

*Abdominal chaetotaxy* (fig. 6).—Tergal setae: female—I–VIII, total 115–122,

$\bar{x}$ 118·60 (5); tergum IX with 1 + 0 posterior seta in 1 out of 5 females; male—I, 5–8, $\bar{x}$ 6·20 (5); VIII, 6–7, $\bar{x}$ 6·25 (4); I–VIII, total 86–90, $\bar{x}$ 88·25 (4). Pleural setae: female—1, 4–6, $\bar{x}$ 4·90 (10 sides); II, 6–7, $\bar{x}$ 6·44 (9); III, 7–8, $\bar{x}$ 7·50 (10); IV, 5–7, $\bar{x}$ 6·80 (10); V, 5–8, $\bar{x}$ 6·90 (10); VI, 5–6, $\bar{x}$ 5·80 (10); VII, 5–6, $\bar{x}$ 5·70 (10); VIII, seta v 1–2, total 2–3; male—(mean of 10 sides); I, 3–5, $\bar{x}$ 3·60; II, 4–6, $\bar{x}$ 5·10; III, 5–7, $\bar{x}$ 6·00; IV, 5–6, $\bar{x}$ 5·90; V, 4–6, $\bar{x}$ 5·30; VI, 4–5, $\bar{x}$ 4·50; VII, 3–4, $\bar{x}$ 3·60; VIII, seta *o* short to moderately long, *i* short to just long and slightly longer than *o*. Sternal setae: female—II, anterior 13–18, $\bar{x}$ 14·50 (6), marginal 6–7, $\bar{x}$ 7 (6); aster, 2–6, $\bar{x}$ 3·11 (18 asters) or 2–4, $\bar{x}$ 2·81 (16); VII, total 31–42, $\bar{x}$ 36·66 (6); genital region, 20–28, $\bar{x}$ 24 (5); vulval marginal, 11–16, $\bar{x}$ 14·43 (7); anal corona, ventral 31–36 ($\bar{x}$ 34), dorsal 30–36 ($\bar{x}$ 32), total 64–67, $\bar{x}$ 66 (5); male—II, anterior 15–25, $\bar{x}$ 21·80 (5), marginal 8–14, $\bar{x}$ 11·60 (5); aster, 3–4, $\bar{x}$ 3·70 (10); VII, total 32–37, $\bar{x}$ 34·33 (3); VIII, total 18–22, $\bar{x}$ 20 (3); genital region, 11–13, $\bar{x}$ 12 (3).

*Material examined*

From *Turdoides earlei*. PAKISTAN: Sind, 8 ♀, 5 ♂ (2 dissected), i.1937 (*R.Meinertzhhgen*, 10392); INDIA: Delhi, 1 ♀, i.vii.1962 (*J.P.Donahue*); BMNH No. 1963–65.

*Holotype* ♀, from *Turdoides earlei*, PAKISTAN: Sind, i.1937 (*R.Meinertzhagen*), slide no. 10392a in BMNH.

*Paratypes* 8 ♀, 5 ♂ from the same host species with data as given above, BMNH.

This species is named in honour of Dr Salim Ali, the eminent ornithologist.

## **Myrsidea breviterga** sp. n.

(figs. 7, 8, 21, 23, 41)

Type host: *Turdoides jardineii* (Smith)

The presence of only 1 + 1 setae on tergum I in both sexes readily distinguishes this and the two following species (*meinertzhageni* and *clamosae*), from *chilchil* and *salimalii*. In this species the extent of the modification of tergum I in the female and the reduction of the hypopharynx in both sexes is intermediate between *salimalii* and *meinertzhageni*.

*Female and male*

Hypopharynx slightly reduced, but one male shows greater reduction. Head seta 10 shorter than 11. Vertical arm of male genital sclerite curved to form a ventral arm which differs strikingly in form and texture from ventral arm of this sclerite in *chilchil*. Posterior metanotal setae: female—3, 4; male—2 + 2 (3), 5 (1). Metapleural setae: female—4 + 4 (2); male—2 + 2 (3), 5 (1). Outer dorsal setae of tibia I: female 7–8, $\bar{x}$ 7·25 (4 tibiae); male—6–8, $\bar{x}$ 6·75 (8). Setae of femoral brush: female—22–26, $\bar{x}$ 24 (4 femora); male—22–25, $\bar{x}$ 23·25 (8).

*Abdominal chaetotaxy* (figs. 7, 8).—Tergal setae: female—(2); I, 2; II, 12; III, 12, 14; IV, 13, 15; V, 17, 15; VI, 17, 16; VII, 14; II–VII, total 85, 86; VIII, 6, 7; male—(4); I, 2; II, 9–13, $\bar{x}$ 11; III, 12–15, $\bar{x}$ 13·50; IV, 13–14, $\bar{x}$ 13·75; V, 14–18, $\bar{x}$ 15·50; VI, 15–16, $\bar{x}$ 15·75; VII, 14–16, $\bar{x}$ 14·75; II–VII, total 83–86, $\bar{x}$ 84·25; VIII, 6–7, $\bar{x}$ 6·25. Pleural setae: female (4 sides)—I, 5–7, $\bar{x}$ 6·25; II, 7–9, $\bar{x}$ 8·25; III, 8–9, $\bar{x}$ 8·75; IV, 8–9, $\bar{x}$ 8·50; V, 6–9, $\bar{x}$ 7·50; VI, 6–8, $\bar{x}$ 6·75; VII, 4–6, $\bar{x}$ 5·25; VIII, seta v 1–2, total

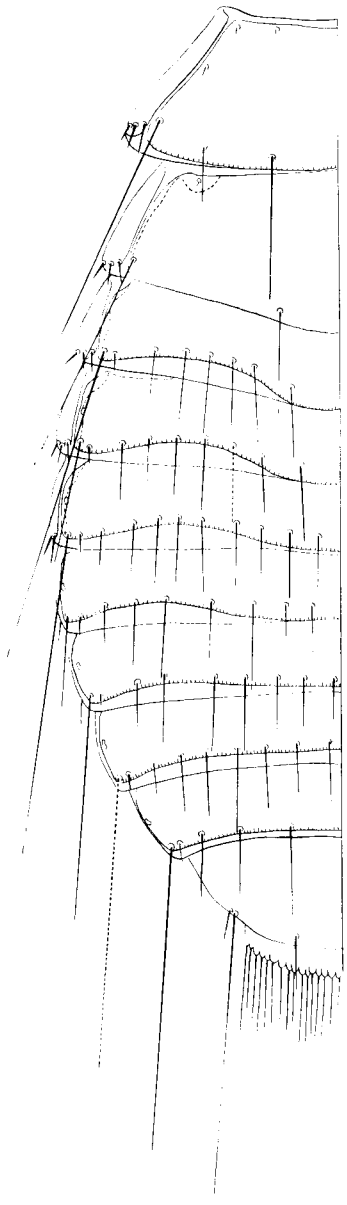


**Fig. 7.** *Myrsidea breviterga*, ♀, holotype, dorsal.

2–3, seta *o* moderately long to just long, *i* moderately long to long and slightly longer than *o*; male (7–8 sides)—I, 3–6, x̄ 4·62; II, 5–7, x̄ 6·14; III, 7–8, x̄ 7·25; IV, 6–7, x̄ 6·85; V, 6–7, x̄ 6·25, VI, 5–6, x̄ 6·12; VII, 3–5, x̄ 4·00; VIII, seta *o* short to moderately long, *i* moderately long to long and longer than *o*. Sternal setae: female—(2); II, anterior 9, 6, marginal 9; aster, 5 (4 asters); VII, total 50, 40; genital region 34, 36; vulval marginal

14, 15; anal corona, total 75, 73; male—II, aster 4–6, $\bar{x}$ 4·87 (8); II–VIII, Tables 3, 6; genital region, 13–19, $\bar{x}$ 16·75.

*Material examined*

From *Turdoides jardineii* (Smith), 2 ♀, 4 ♂, N. TRANSVAAL: Mabelikwa, 6.i.1957 and E. TRANSVAAL: Newington, 13.vii.1957 (*F. Zumpt*), BMNH Nos. 1957-434, 1958-76.

*Holotype* ♀, from *Turdoides jardineii*, E. TRANSVAAL, Newington, 13.vii.1957 (*F. Zumpt*, 13), slide no. 711, in BMNH.

*Paratypes* 1 ♀, 4 ♂ from the same host species with data as given above, BMNH.

One female collected from *Turdoides jardineii* from RHODESIA, Salisbury (*H.D. Jackson*, 1553), 29.viii.1969, is not conspecific with *breviterga*.

## **Myrsidea meinertzhageni** sp.n.

(Plate I, fig. 3; figs. 9, 17, 22, 24, 25, 27, 42, 43)

Type host: *Turdoides fulvus billypayni* (Meinertzhagen)

This new species is distinguished from *breviterga* in the female by the greater modification of tergum I and larger number of setae on tergum VIII; in the male by fewer tergal setae on II–VII and central sternal setae (especially on VII and VIII) and denser brushes on sternites IV and V (Tables 3, 6). Additional distinguishing characters are the shape of the metasternal plate, especially its posterior half which is narrower, and the male genital sclerite, the vertical arm of which is diagnostic.

*Female and male*

Hypopharynx considerably reduced. Head seta 10 slightly shorter than 11 in the female and approximately as long as or slightly shorter than 11 in the male. Posterior metanotal setae: female—2 + 2 (7), 2 + 3 (1); male—2 + 2 (9), 3 (1), 5 (1). Metapleural setae: female—3–5, $\bar{x}$ 3·77 (18 sides); male—2 + 2 (11). Outer dorsal setae of tibia I: female—9–15, $\bar{x}$ 11·91 (12 tibiae); male—9–14, $\bar{x}$ 12 (14). Setae of femoral brush: female—31–39, $\bar{x}$ 34·83 (12 femora); male—25–31, $\bar{x}$ 28·31 (16).

*Abdominal chaetotaxy* (fig. 9). Tergal setae: female (5)— I, 2; II, 16–17, $\bar{x}$ 16·20; III, 13–18, $\bar{x}$ 16; IV, 15–17, $\bar{x}$ 16·20; V, 16–20, $\bar{x}$ 18·20; VI, 16–20, $\bar{x}$ 18·60; VII, 17–20, $\bar{x}$ 18·40; II–VII, total 102–108, $\bar{x}$ 104; VIII, 12–15, $\bar{x}$ 13; tergum IX with 2 + 2 posterior setae in 1 out of 5 females; male (6)—I, 2; II, 9–10, $\bar{x}$ 9·33; III, 10–14, $\bar{x}$ 11·16; IV, 10–13, $\bar{x}$ 11·50; V, 11–15, $\bar{x}$ 12·83; VI, 12–16, $\bar{x}$ 13·83; VII, 9–13, $\bar{x}$ 10·66; II–VII, total 64–76, $\bar{x}$ 69·33; VIII, 5–9, $\bar{x}$ 6·66. Pleural setae: female (mean of 10 sides given for comparison with *breviterga*)—I, 7·60; II, 8·30; III, 9·30; IV, 8·70; V, 8·40; VI, 7·80; VII, 6·30; VIII, seta v 1 + 1 (5); seta *o* moderately long to just long, *i* short to moderately long, seta *o* slightly longer than *i*; male (mean of 14 sides given)—I, 4·21; II, 5·77; III, 7·07; IV, 6·14; V, 5·85; VI, 4·93; VII, 3·58; VIII, seta *o* short to moderately long, *i* moderately long and slightly longer than *o*. Sternal setae: female—II, anterior 9–13, $\bar{x}$ 10·80 (5), marginal 7–9, $\bar{x}$ 8·40 (5); aster, 3–5, $\bar{x}$ 3·91 (12 asters): VII, total 37–42, $\bar{x}$ 39·17 (6); genital region, 14–27, $\bar{x}$ 19·33 (6); vulval marginal, 13–16, $\bar{x}$ 14·50 (6); anal corona, ventral and dorsal 38–44, total $\bar{x}$ 81·20 (5); male—aster, 3–4, $\bar{x}$ 3·50 (16); II–VIII Tables 3, 6; genital region, 3–8, $\bar{x}$ 4·60 (10). Out of 6 males examined one has the number

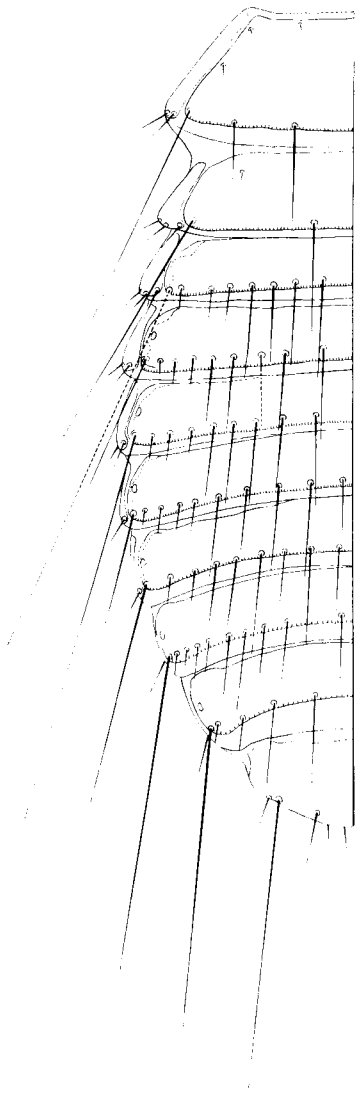


**Fig. 8.** *Myrsidea breviterga*, ♂, dorsal.

of sternal setae on IV–VI much greater than in the others, and therefore in Tables 3 and 6 the chaetotaxy is given with and without this probably abnormally hirsute individual.

*Material examined*

From *Turdoides fulvus billypayni* (Meinertzhagen), MOROCCO: 9 ♀, 11 ♂ (2 dissected), xi.1938 (*R.Meinertzhagen*, 12361–62), BMNH.

*Holotype* ♀, from *Turdoides fulvus billypayni*, MOROCCO: xi.1938 (*R. Meinertzhagen*), slide no. 12361–62a, in BMNH. *Paratypes* 8 ♀, 11 ♂ from the same host species with data as given above, BMNH.

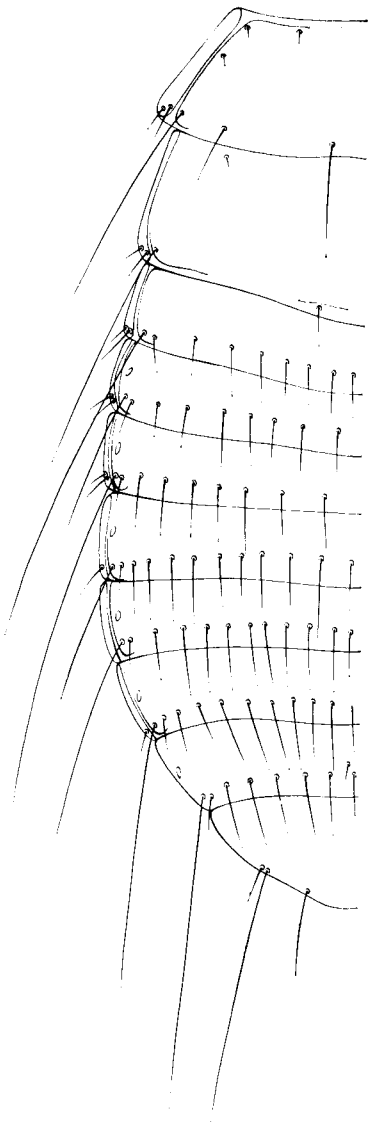


**Fig. 9.** *Myrsidea meinertzhageni*, ♀, holotype, dorsal.

This species is dedicated to the late Col. R.Meinertzhagen, the eminent ornithologist, who collected many of the specimens on which the species described here are based.

In specimens from *Turdoides fulvus acaciae* (Lichtenstein) the range of tergal setae in the male on II–VII (total 72–87, $\bar{x}$ 79·66 (3)) and the number of setae in the genital region (9–11, $\bar{x}$ 10·2 (5)) are slightly greater, and in the female the number of setae in the femoral brush (25–31, $\bar{x}$ 27·66 (12 femora)) is less. In both sexes the average of setae in the aster is slightly higher (female, 4·02 (24 asters); male 4·07 (14)). Apart from these

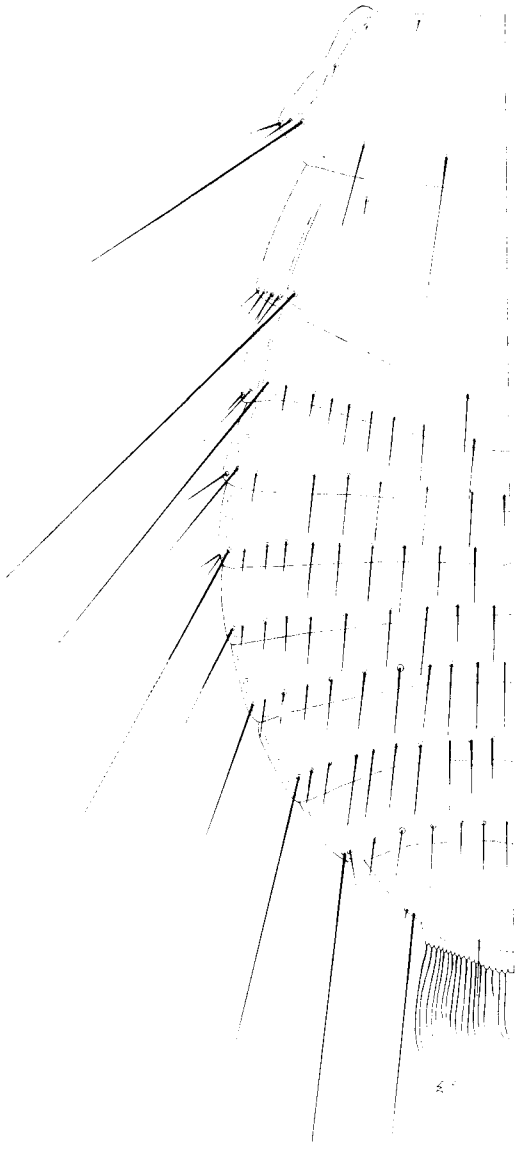


**Fig. 10.** *Myrsidea clamosae*, ♀, holotype, dorsal.

minor differences no other differences are discernible, and the specimens are included in the species as *meinertzhageni* sens. lat.

*Material examined.*—From *Turdoides fulvus acaciae*, 13 ♀, 11 ♂, 1 nymph, EGYPT (now U.A.R.): v.1936 and SUDAN: xii.1947 (*R.Meinertzhagen*, 4588, 17066), BMNH.

Three females from *Turdoides fulvus maroccanus* resemble *meinertzhageni* females from *T. fulvus billypayni*, and their chaetotaxy in general falls within the range of the

latter species. However, these specimens have fewer outer dorsolateral setae on tibia I (8–11, x̄ 9·33 (6 tibiae)) and on femur III (28–31, x̄ 29·50 (6 femora)), but as there is overlap in their numbers these specimens have been included in *meinertzhageni* sens. lat.

*Material examined.*—From *Turdoides fulvus maroccanus* Lynes, 3 ♀, MOROCCO: x.1938 (*R.Meinertzhagen*, 11892).

## **Myrsidea clamosae** sp. n.

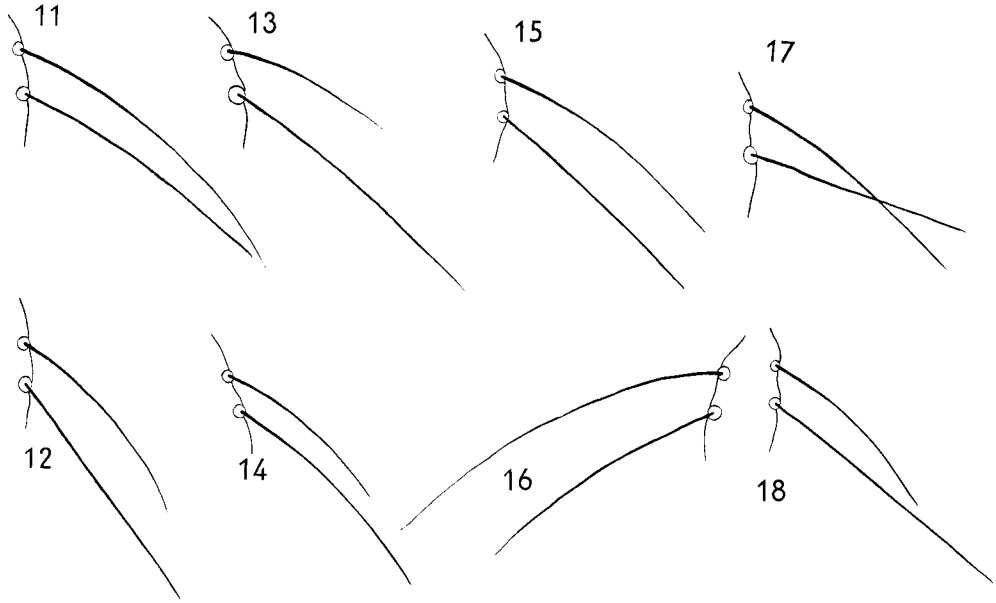
(Plate I, fig. 5; figs. 10, 18, 26, 28–30, 44, 45)

Type host: *Turdoides melanopes clamosus* (van Someren)

This species is distinguished in the female from *breviterga* and *meinertzhageni* by the considerably modified tergum I and in addition from *meinertzhageni* by fewer setae in the femoral brush and on tibia I and more setae in the genital region. In the male it is distinguished from *meinertzhageni* by the greater number of tergal setae, especially on VIII, by the sternal chaetotaxy, especially the greater number of central sternal setae and those on the genital region; from *breviterga* by the greater number of tergal setae on VIII, details of chaetotaxy of sterna II–IV (Tables III and VI) and proportions of the genital sclerite of which the vertical arm, especially the ventral arm, is diagnostic. Characters as in *meinertzhageni* are not given.

*Female and male*

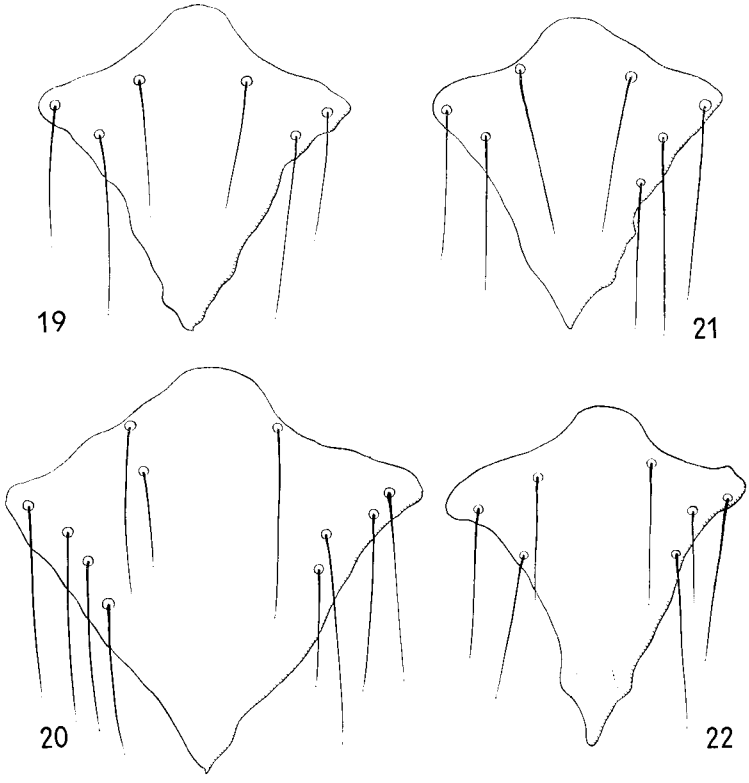
Head seta 10 shorter than 11. Posterior metanotal setae: female (10), male (12), 2 + 2. Metapleural setae: female—4–5, x̄ 4·22 (24 sides); male—2 + 2 (13), 5 (1), 2 + 5 (1).




**Figs. 11–18.** Head setae 10 and 11 of *Myrsidea* species: (11, 12) *satbhai* from type host, (11) ♀, (12) ♂; (13) *satbhai* ♀ from *T. melanops vepres*; (14) *bharat*, ♂; (15) *chilchil* ♀ from type host; (16) *chilchil* ♀ from *T. squamiceps*; (17) *meinertzhageni* ♂ from type host; (18) *clamosae* ♂ from type host.

Outer dorsal setae of tibia I: female—5–9, x̄ 7 (18 tibiae); male—6–9, x̄ 6·87 (16). Setae of femoral brush: female—23–29, x̄ 25·54 (13 femora); ♂, 20–26, x̄ 23 (13).

*Abdominal chaetotaxy* (fig. 10).—Tergal setae: female (mean of 7 given).—II, 13·14; III, 13·43; IV, 13·71; V, 17·43; VI, 17·57; VII, 16·14; II–VII, total 87–96, x̄ 91·43; VIII, 10–13, x̄ 11·85; male—II, 10–13, x̄ 12 (5); III, 13–16, x̄ 14·20 (5); IV, 13–16, x̄ 14·60 (5); V, 14–18, x̄ 16 (5); VI, 15–19, x̄ 17 (5); VII, 13–17, x̄ 14·80; II–VII, total 84–93, x̄ 89·20 (5); VIII, 9–13, x̄ 10·12 (8); tergum IX with 2 + 1 posterior setae in 2 out of 6 males examined. Pleural setae: female (mean of 12 sides given for comparison with *meinertzhageni*)—I, 8·66; V, 9·25; VIII, seta v, 0–1, total 1–2 (4 out of 6 females); seta *o* short to moderately long, *i* moderately long to just long and slightly longer than *o*; male (mean of 10 sides given)—I, 5·50; II, 6·60; III, 7·40; V, 5·90; VI, 5·20; VII, 4; VIII, setae *o* and *i* as in the female. Sternal setae: female—II, anterior 15–24, x̄ 21 (3); marginal 9–11, x̄ 9·81 (11); aster, 4–6, x̄ 4·96 (26 asters); VII total 45–54, x̄ 49 (6); genital region, 30–40, x̄ 34·83 (6); vulval marginal, 12–16, x̄ 13·13 (9); anal corona, total 65–78, x̄ 73·11 (9); in one female the outermost setae of the marginal row on sternite II on the right side is intermediate in proportions between the marginal setae and the innermost seta of the aster of that side; male—II, aster, x̄ 5·04 (22); II–VIII, Tables 3, 6; genital region, 13–22, x̄ 17·55 (11).




**Figs. 19–22.** Metasternal plate of *Myrsidea* species: (19) *satbhai* ♂ from type host; (20) *salimalii*, ♀; (21) *breviterga*, ♂; (22) *meinertzhageni* ♂ from type host.

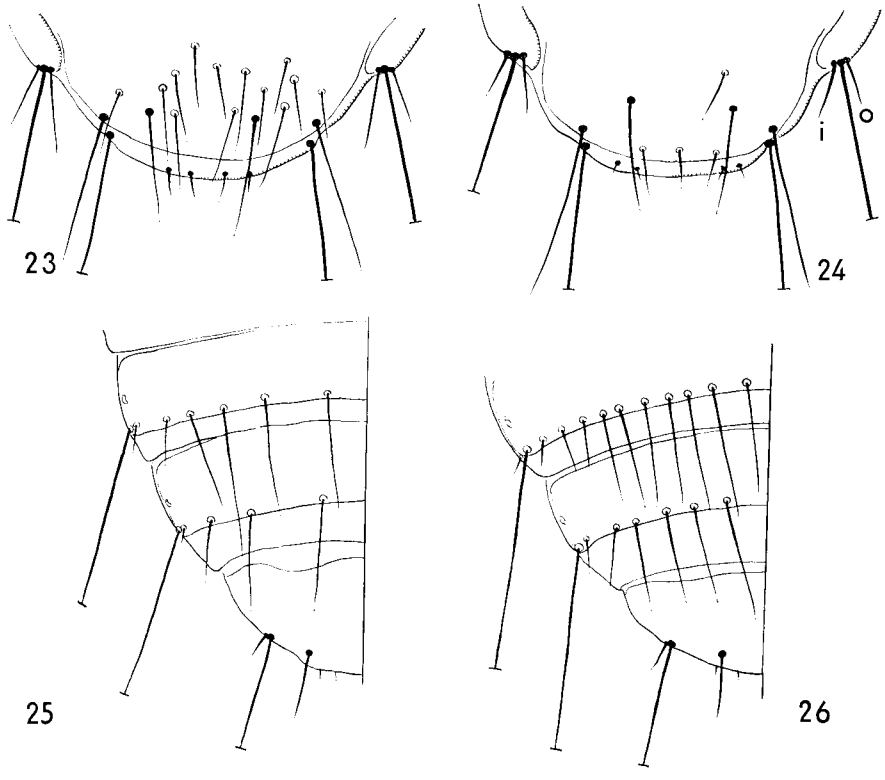
*Material examined*

From *Turdoides melanops clamosus* (van Someren), KENYA: 13 ♀, 17 ♂ (2 dissected), iii.1936 (*R.Meinertzhagen*, 7129, 7325, 7339, 7343, 7345, 7369), BMNH.

*Holotype* ♀, from *Turdoides melanops clamosus*, KENYA, iii.1936 (*R.Meinertzhagen*), slide no. 7129a, in BMNH.

*Paratypes* 12 ♀, 17 ♂ from the same host species with data as given above, BMNH.

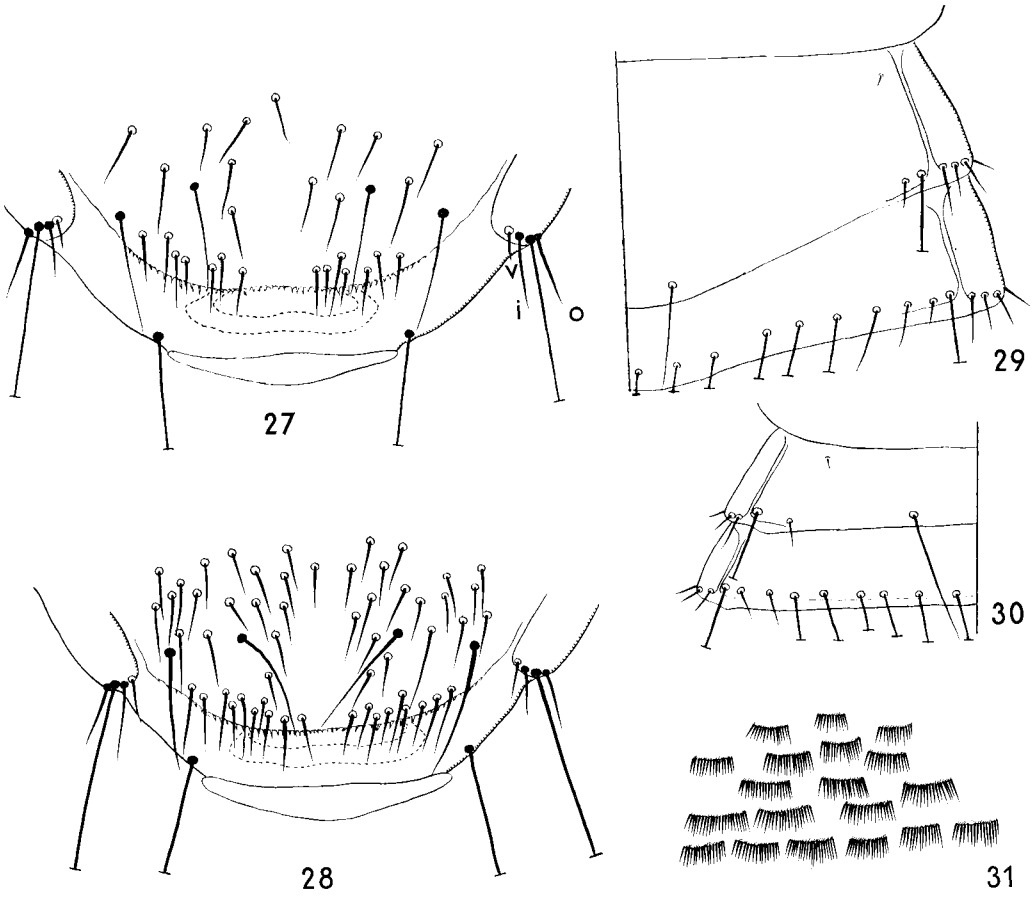
Two females and three males out of thirteen and seventeen respectively have on one side only of tergum I a spiniform seta inner to the post-spiracular seta. In one male it is well removed from the post-spiracular seta (fig. 30), but in all other specimens (fig. 29) the relationship of the two setae is typical of the post-spiracular seta and the seta associated with it (Clay, 1970). In certain *Myrsidea* species from *Garrulax* having only two central seta on tergum I, normally a spiniform seta is present inner to each post-spiracular seta; being well removed from the post-spiracular seta, it is not the associated but a normal tergal seta. Hence, in the male of *clamosae* in which the spiniform seta is well removed from the post-spiracular seta, it has been regarded as a tergal seta. In the remaining two specimens of each sex it has not been possible to decide whether this seta is a normal tergal seta in the process of being added or lost, or the spiniform seta of the post-spiracular




**Figs. 23–26.** Terminal segments of abdomen of *Myrsidea* species, ♂: (23) *breviterga*, ventral; (24, 25) *meinertzhageni* from type host (24) ventral, (25) dorsal; (26) *clamosae* from type host, dorsal. *i*, inner seta; *o*, outer seta.

setal complex, also present on tergum I. This seta is not included in the setal count given for tergum I.

In one male and one female available from *Turdoides plebejus platycircus* (Swainson), the number of tergal setae (female—II–VII, 88 and VIII, 13; male—II–VII, 90 and VIII, 9), dorsolateral setae of tibia I (female, 8 + 9; male, 8 + 6), setae of femoral brush (female 26 + 24; male, 22 + 23) falls within the range of specimens from *T.melanops clamosus*. But in the female the number of sternal setae on II (anterior 13, marginal 7), VII (total 40), and in the genital region (25) is less. However, the modification of tergum I in the female and the reduction of the hypopharynx in both sexes are the same. The male genital sclerite is too distorted for comparison. These two specimens are considered to be conspecific with *clamosae* sens. lat.




**Figs. 27–31.** *Myrsidea* species. (27, 28) Female genital region (anal setae omitted): (27) *meinertzhageni*, holotype; (28) *clamosae*, holotype. (29, 30) Terga I and II of *clamosae* from type host; (29) ♀; (30) ♂. (31) *satbhai* from type host, combs of microtrichia projecting from wall of genital chamber of ♀. *i*, inner seta; *o*, outer seta.

*Material examined.*—From *Turdoides plebejus platycircus*, SENEGAL: Dakar, 1 ♀, 1 ♂, 15.xi.1954, BMNH No. 1955–334.

Two females and one male from *Turdoides bicolor* (Jardine) resemble *clamosae* sensu stricto in the taxonomically important non-sexual characters. The number of most setae falls within the range of *clamosae*, but the pleural setae average less in the female and are significantly stouter. The male genital sclerite is distorted and not comparable. The taxonomic status of these specimens could not be established.

*Material examined.*—From *Turdoides bicolor*, TRANSVAAL: 2 ♀, 1 ♂, vii.1935 (*R.Meinertzhagen*, 4011), BMNH.

## IV KEY TO THE SPECIES OF *Myrsidea* PARASITIC ON *Turdoides*

1 Sitophore sclerite of hypopharynx absent and male genital sclerite characteristic (Plate I, figs. 1, 4; fig. 32) ..... 2

– Sitophore sclerite of hypopharynx present but variable and male genital sclerite not as above (Plate I, figs. 2, 5; fig. 39) ..... 3

2 (1) Female terga I and II normal (fig. 1); male genital sclerite as in figure 33 **satbhai** Ansari

– Female terga I and II noticeably enlarged (fig. 3); male genital sclerite as in figure 34 ..... **bharat** sp. n.

3 (1) Tergum I with more than 10 setae in the female and more than 5 in the male (figs. 4–6) ..... 4

– Tergum I with only 2 setae in both sexes (figs. 7–10) ..... 5

4 (3) Female metanotum slightly modified, with 4–5 posterior setae (fig. 4); sternite II with 4–9 anterior setae. Male genital sclerite as in figures 36, 37 ..... **chilchil** Ansari

– Female metanotum greatly modified, with 2 posterior setae (fig. 6); sternite II with 13–18 anterior setae. Male genital sclerite as in figure 40 **salimalii** sp. n.

5 (3) Females ..... 6

– Males ..... 8

6 (5) Tergum I slightly modified and tergum VIII with fewer than 8 setae (fig. 7) ..... **breviterga** sp. n.

– Tergum I considerably modified and tergum VIII wth more than 9 setae 7

7 (6) Fewer than 28 ($\bar{x}$ fewer than 23) setae in the genital region (fig. 27); outer tibial setae 9–15, $\bar{x}$ more than 10 ..... **meinertzhageni** sp. n.

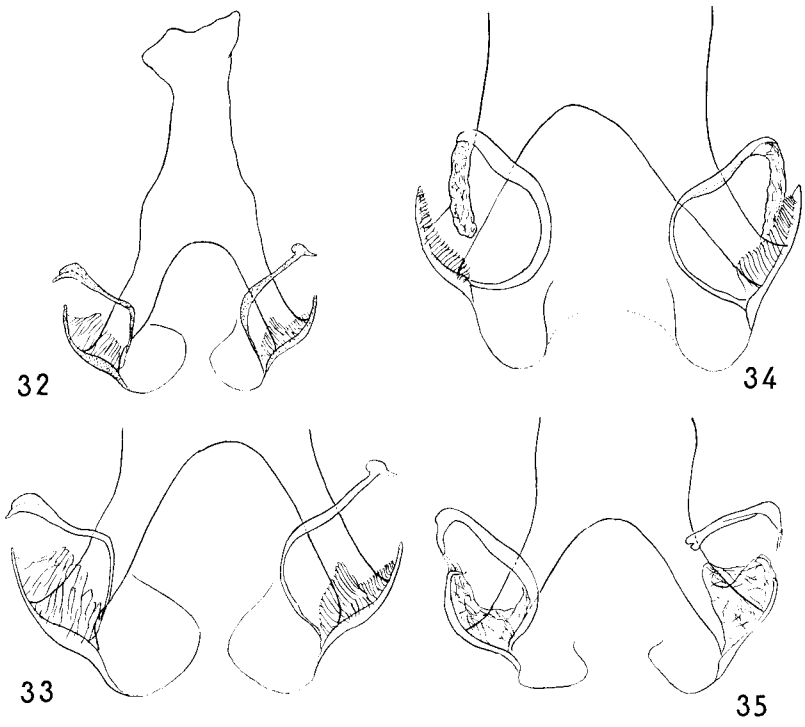
– More than 29 ($\bar{x}$ more than 33) setae in the genital region (fig. 28); outer tibial setae 5–9, $\bar{x}$ fewer than 8 ..... **clamosae** sp. n.

8 (5) Fewer than 10 setae in the genital region (fig. 24); outer tibial setae 9–14, $\bar{x}$ more than 10; genital sclerite as in figures 48, 49 ..... **meinertzhageni** sp. n.

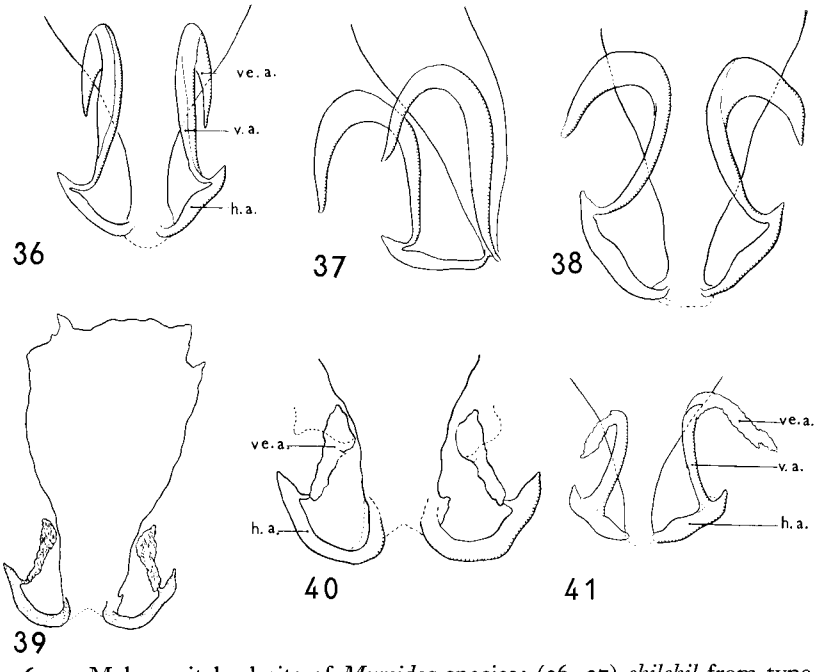
– More than 12 setae in the genital region; outer tibial setae 6–9, $\bar{x}$ fewer than 7; genital sclerite not as above ..... 9

9 (6) Tergum VIII with 9–13 setae (fig. 26); genital sclerite as in figures 44, 45 **clamosae** sp. n.

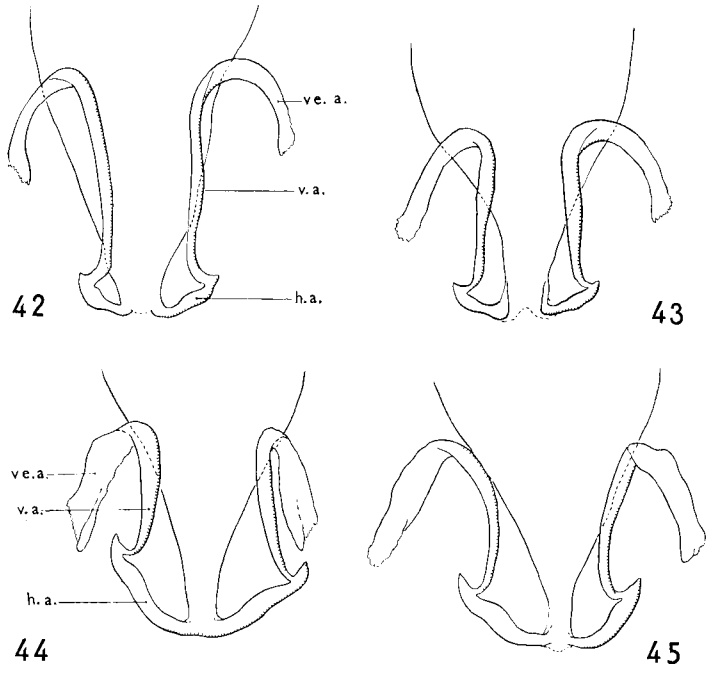
– Tergum VIII with 6–7 setae; genital sclerite as in figure 41 ..... **breviterga** sp. n.




**Figs. 32–35.** Male genital sclerite of *Myrsidea* species: (32, 33) *satbhai* from type host; (34) *bharat*; (35) *satbhai* from *T. melanops vepres*.




**Figs. 36–41.** Male genital sclerite of *Myrsidea* species: (36, 37) *chilchil* from type host, (36) dorsal, (37) lateral; (38) *chilchil* from *T. squamiceps*, dorsal; (39, 40) *salimalii*; (41) *breviterga*, slightly distorted on left hand side. *h.a.*, horizontal arm; *v.a.*, vertical arm; *ve. a.*, ventral arm.




**Figs. 42–45.** Male genital sclerite of *Myrsidea* species: (42, 43) *meinertzhageni* from type host; (44, 45) *clamosae* from type host. Abbreviations as in figs. 36–41.

## V HOST-PARASITE RELATIONSHIPS

### *Host-parasite list*

Species of *Turdoides* arranged according to Deignan (1964). Type hosts are marked with an asterisk.

| | |
|---|---|
| **Turdoides c.caudatus* | *M.chilchil* Ansari, 1951 |
| **Turdoides earlei* | *M.salimalii* sp. n. |
| **Turdoides malcomi* | *M.bharat* sp. n. |
| *Turdoides s.squamiceps* | *M.chilchil* sens. lat. |
| *Turdoides squamiceps yemensis* | *M.chilchil* sens. lat. |
| *Turdoides fulvus maroccanus* | *M.meinertzhageni* sens. lat. |
| **Turdoides fulvus billypayni* | *M.meinertzhageni* sp. n. |
| *Turdoides fulvus acaciae* | *M.meinertzhageni* sens. lat |
| **Turdoides s.striatus* | *M.satbhai* Ansari, 1951 |
| *Turdoides striatus somervillei* | *M.satbhai* Ansari, 1951 |
| *Turdoides striatus sindianus* | *M.satbhai* Ansari, 1951 |
| *Turdoides melanops vepres* | *M.satbhai* sens. lat. |
| **Turdoides melanops clamosus* | *M.clamosae* sp. n. |
| *Turdoides plebejus platycircus* | *M.clamosae* sens. lat |
| **Turdoides jardineii* | *M.breviterga* sp. n. |
| *Turdoides bicolor* | *M.*sp. |

In the *Check-List of Birds of the World* (Volume 10, 1964), Deignan included 25 species in the genus *Turdoides* (subfamily Timaliinae), the majority of which are polytypic. Specimens of *Myrsidea* have been available from only ten of these species; from one (*bicolor*), although the series was inadequate for description, the affinities of the louse could be determined. As in the species of *Myrsidea* previously studied (Clay, 1966, 1968), the form of the male genital sclerite is the only character indicative of affinities. If the species of *Myrsidea* from *Turdoides* are grouped according to this character they form two main groups, A and B, as listed below.

*Myrsidea* species from too few species of *Turdoides* are known to draw any conclusions on host-parasite relations. One unexpected distribution is the occurrence of different and distinctive species of *Myrsidea* on two subspecies of *Turdoides melanops* in Kenya. The species parasitic on *T.melanops vepres* also parasitises *T.striatus* and, together with that parasitic on *T.malcolmi* (both these host species being found in the Indian subcontinent), forms a distinct species-group. That on *T.melanops clamosus*, however, belongs to a different species-group and is also found on a West African species of *Turdoides* and is near a species parasitic on a North African one (see list below).

Myrsidea *host list*

| | *Myrsidea* species | *Turdoides* species | Locality of specimens |
|---|---|---|---|
| A | *M.satbhai* Ansari, 1951 | *Turdoides s.striatus* | Panjab, Pakistan; Rajputana, U.P., India |
| | | *T.striatus sindianus* | Sind, Pakistan |
| | | *T.striatus somervillei* | Bombay, U.P., A.P., India |
| | | *T.melanops vepres* | Nanyuki, Kenya |
| | *M.bharat* sp. n. | *T.malcolmi* | Rajputana, Deccan, Hyderabad (A.P.), India |
| B | *M.chilchil* Ansari, 1951 | *T.c.caudatus* | Panjab, Pakistan; Rajputana, M.P., India |
| | | *T.s.squamiceps* | Saudi Arabia, Israel, Palestine |
| | | *T.squamiceps yemensis* | Aden |
| | *M.salimalii* sp. n. | *T.earlei* | Sind, Pakistan; Delhi, India |
| | *M.breviterga* | *T.jardineii* | N. and E. Transvaal, S. Africa |
| | *M.meinertzhageni* sp. n. | *T.fulvus billypayni* | S.E.Morocco |
| | | *T.fulvus maroccanus* | Morocco |
| | | *T.fulvus acaciae* | Egypt, Sudan |
| | *M.clamosae* sp. n. | *T.melanops clamosus* | Kenya |
| | | *T.plebejus platycircus* | Dakar, Senegal |
| | *M.*sp.? (near *clamosae*) | *T.bicolor* | Transvaal, S.Africa |

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**Table 1.** *Myrsidea* spp.: central setae of sternites, female. No. of specimens in parenthesis.

| | | *satbhai* from *T.s.striatus* (7) | | *satbhai* from *T.melanops vepres* (7) | | *bharat* (6) | | *chilchil* from *T.c.caudatus* (7) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Range | Mean | Range | Mean | Range | Mean | Range | Mean |
| II | anterior | 4–12* | 6·83* | 8† | | 4–8 | 5·33 | 4–9 | 6 |
| | marginal | 16–20* | 18·16* | 17–20 | 18·85 | 17–20 | 18·16 | 6–8 | 7·28 |
| | total | 22–30* | 25* | 26† | | 22–25 | 23·50 | 10–16 | 13·28 |
| III | anterior | 4–9 | 6·14 | 2–3 | 2·28 | 4–7 | 6 | Absent | |
| | marginal | 12–19 | 15·14 | 12–15 | 13·85 | 13–17 | 15·66 | 2–7 | 3·85 |
| | total | 17–27 | 21·28 | 15–18 | 16·14 | 18–24 | 21·66 | 2–7 | 3·85 |
| IV | anterior | 18–24 | 20·30 | 16–20 | 17·43 | 13–15 | 14·50 | 7–12 | 9·42 |
| | marginal | 14–17 | 15·57 | 11–18 | 15·57 | 12–17 | 14·50 | 10–15 | 13 |
| | total | 32–41 | 35·85 | 31–36 | 33 | 25–31 | 29 | 17–25 | 22·43 |
| V | anterior | 17–23 | 19·43 | 19–23 | 20·43 | 12–16 | 14·33 | 5–12 | 9·28 |
| | marginal | 13–16 | 14·85 | 14–18 | 15·30 | 12–16 | 14·50 | 9–14 | 12 |
| | total | 32–39 | 34·28 | 33–38 | 35·71 | 24–31 | 28·83 | 15–26 | 21·28 |
| VI | anterior | 15–22 | 19·30 | 18–23 | 19·57 | 12–17 | 14·16 | 10–14 | 11·85 |
| | marginal | 14–17 | 15 | 11–14 | 13·14 | 11–15 | 14 | 10–14 | 12 |
| | total | 29–39 | 34·28 | 31–34 | 32·71 | 23–31 | 28·16 | 20–27 | 23·85 |
| VII | anterior | 14–20 | 17·14 | 12–19 | 17·57 | 10–17 | 13·33 | 15–23 | 17·43 |
| | marginal | 9–12 | 10 | 10–12 | 10·57 | 8–11 | 9·16 | 7–10 | 8 |
| | total | 23–30 | 27·14 | 23–31 | 28·14 | 18–26 | 22·50 | 23–30 | 25·43 |

* of 6 only.
† of 1 only.

**Table 2.** *Myrsidea* spp.: central setae of sternites, male. No. of specimens in parenthesis.

| | | *satbhai* from *T.s.striatus* (7) | | *satbhai* from *T.melanops vepres* (3) | | *bharat* (5) | | *chilchil* from *T.c.caudatus* (4) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Range | Mean | Range | Mean | Range | Mean | Range | Mean |
| II | anterior | 15–24 | 18·28 | 19–21* | 20* | 12–18 | 14·4 | 9–14 | 11·25 |
| | marginal | 14–21 | 18 | 19 | 19 | 16–21 | 18·4 | 8–11 | 9·75 |
| | total | 29–45 | 36·28 | 38–40* | 39* | 28–36 | 32·8 | 19–24 | 21 |
| III | anterior | 3–9 | 7·14 | 3–6 | 4·33 | 3–7 | 4·40 | 0–2 | 0·75 |
| | marginal | 13–15 | 14·30 | 12–14 | 13 | 14–18 | 15·60 | 7–10 | 8·25 |
| | total | 17–23 | 21·43 | 15–19 | 17·33 | 18–23 | 20 | 7–12 | 9 |
| IV | anterior | 14–18 | 15·85 | 12–15 | 13·66 | 10–15 | 11·4 | 2–8 | 4·75 |
| | marginal | 13–19 | 14·57 | 13–16 | 14·66 | 14–16 | 14·4 | 7–13 | 9·75 |
| | total | 27–34 | 30·43 | 25–30 | 28·33 | 24–31 | 25·8 | 9–21 | 14·50 |
| V | anterior | 13–18 | 15·14 | 11–18 | 14·33 | 10–13 | 10·8 | 6–11† | 7·66† |
| | marginal | 12–18 | 14·71 | 12–15 | 13 | 11–15 | 13·6 | 10–11† | 10·33† |
| | total | 27–33 | 29·85 | 26–30 | 27·33 | 24–25 | 24·4 | 16–22† | 18† |
| VI | anterior | 10–16 | 12·85 | 13–14 | 13·66 | 11–14 | 12 | 4–7 | 6 |
| | marginal | 12–15 | 13·14 | 12–14 | 12·66 | 11–23 | 15·6 | 7–10 | 9·75 |
| | total | 23–30 | 26 | 25–28 | 26·33 | 22–34 | 27·6 | 13–18 | 15·75 |
| VII | anterior | 11–16 | 13·14 | 15–16 | 15·33 | 8–10 | 8·6 | 5–12 | 7·50 |
| | marginal | 5–14 | 11·71 | 9–11 | 10·33 | 9–13 | 11·6 | 7–9 | 8 |
| | total | 17–29 | 24·85 | 25–26 | 25·66 | 27–23 | 20·2 | 12–21 | 15·50 |
| VIII | anterior | 7–20 | 15·14 | 11–17 | 14·66 | 7–15 | 11·6 | 7–8 | 7·75 |
| | marginal | 6–12 | 8·30 | 9–10 | 9·66 | 8–10 | 8·8 | 6–9 | 7·25 |
| | total | 17–29 | 23·43 | 21–26 | 24·33 | 16–24 | 20·4 | 14–17 | 15 |

* of 2 only.
† of 3 only.

**Table 3.** *Myrsidea* spp.: central setae of sternites, male. No. of specimens in parenthesis.

| | | *breviterga* (4) | | *meinertzhageni* from *T. fulvus billypayni* (6) | | (5) | | *clamosae* from *T. melanops clamosus* (6) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Range | Mean | Range | Mean | Range | Mean | Range | Mean |
| II | anterior | 14–22 | 19·25 | 12–14 | 13·33 | | | 23–28 | 25·83 |
| | marginal | 12–13 | 12·75 | 9–12 | 10·83 | | | 14–17 | 15·66 |
| | total | 26–35 | 32 | 22–26 | 24·16 | | | 39–43 | 41·50 |
| III | anterior | 3–9 | 5·75 | Absent | | | | 1–4 | 2·33 |
| | marginal | 10–15 | 13 | 9–13 | 10·28 | | | 11–15 | 12·50 |
| | total | 13–24 | 18·75 | 9–13 | 10·28 | | | 13–19 | 14·83 |
| IV | anterior | 9–14 | 11·75 | 6–13 | 8·33 | 6–9 | 7·40 | 11–15 | 12·50 |
| | marginal | 14–15 | 14·75 | 9–13 | 10·83 | 9–11 | 10·40 | 13–15 | 14·33 |
| | total | 23–29 | 26·50 | 15–26 | 19·16 | 15–19 | 17·80 | 26–28 | 26·83 |
| V | anterior | 9–15 | 13 | 6–14 | 8·66 | 6–11 | 7·60 | 9–17 | 12·50 |
| | marginal | 14–15 | 14·50 | 10–14 | 11 | 10–11 | 10·40 | 13–15 | 14·66 |
| | total | 23–30 | 27·50 | 16–28 | 19·66 | 16–21 | 18 | 22–32 | 27·16 |
| VI | anterior | 9–15 | 12 | 5–17 | 8·16 | 5–7 | 6·40 | 11–14 | 12·50 |
| | marginal | 13–16 | 14·50 | 10–13 | 10·66 | 10–11 | 10·20 | 13–16 | 13·83 |
| | total | 24–28 | 26·50 | 15–30 | 18·83 | 15–17 | 16·60 | 24–29 | 26·33 |
| VII | anterior | 13–21 | 16·25 | 3–6 | 5 | | | 14–19 | 16·50 |
| | marginal | 8–11 | 9·75 | 6–8 | 7·33 | | | 9–24 | 12·16 |
| | total | 22–29 | 26 | 9–14 | 12·33 | | | 24–38 | 28·66 |
| VIII | anterior | 11–25 | 20·25 | 3–8* | 5·83* | | | 14–22 | 19·50 |
| | marginal | 8–9 | 7·50 | 3–6* | 5* | | | 8–10 | 8·83 |
| | total | 19–34 | 27·75 | 7–13* | 10·83* | | | 22–32 | 28·33 |

* of 7.

**Table 4.** *Myrsidea* spp.: setae in lateral sternal brushes, female. No. of specimens in parenthesis.

| | | *satbhai* from *T.s.striatus* | | *satbhai* from *T.melanops vepres* | | *bharat* | | *chilchil* from *T.c.caudatus* | |
|---|---|---|---|---|---|---|---|---|---|
| | | Each side | Mean (14 sides) | Each side | Mean (14 sides) | Each side | Mean (12 sides) | Each side | Mean (14 sides) |
| III | anterior | 0–5 | 1·57 | 0 | 0 | 0–3 | 1·33 | 0–3 | 0·56 |
| | marginal | 3–6 | 4·71 | 3–5 | 4·07 | 3–5 | 4·25 | 2–4 | 2·85 |
| | total | 5–9 | 6·28 | 3–5 | 4·07 | 4–7 | 5·58 | 2–6 | 3·42 |
| IV | anterior | 19–30 | 22·42 | 16–23 | 19·14 | 15–21 | 18·25 | 15–20 | 17·50 |
| | marginal | 7–9 | 7·78 | 6–7 | 6·78 | 7–8 | 7·41 | 7–9 | 7·57 |
| | total | 27–37 | 30·21 | 23–30 | 25·93 | 23–29 | 25·66 | 23–28 | 25·07 |
| V | anterior | 20–26 | 23·07 | 20–26 | 23·50 | 16–25 | 20·33 | 15–24 | 20·43 |
| | marginal | 7–9 | 7·57 | 6–8 | 7 | 6–8 | 7·16 | 7–9 | 7·85 |
| | total | 27–34 | 30·64 | 27–34 | 30·50 | 22–33 | 27·50 | 22–32 | 28·28 |
| VI | anterior | 12–16 | 14·21 | 13–19 | 15·64 | 8–16 | 11·66 | 14–18 | 16 |
| | marginal | 4–6 | 4·78 | 4–6 | 5·21 | 4–6 | 5·25 | 6–7 | 6·71 |
| | total | 17–22 | 19 | 17–24 | 20·85 | 13–22 | 16·92 | 20–25 | 22·71 |
| VII | anterior | 3–5 | 4·57 | 4–10 | 7·21 | 2–6 | 4·08 | 4–11 | 6·21 |
| | marginal | 2 | 2 | 2 | 2 | 2 | 2 | 2–4 | 2·78 |
| | total | 5–7 | 6·57 | 6–12 | 9·21 | 4–8 | 6·08 | 7–13 | 9 |

**Table 5.** *Myrsidea* spp.: setae in lateral sternal brushes, male.

| | | *satbhai* from *T.s.striatus* | | *satbhai* from *T.melanops vepres* | | *bharat* | | *chilchil* from *T.c.caudatus* | |
|---|---|---|---|---|---|---|---|---|---|
| | | Each side | Mean (14 sides) | Each side | Mean (6 sides) | Each side | Mean (10 sides) | Each side | Mean (8 sides) |
| III | anterior | 0–3 | 0·85 | 0–1 | 0·50 | 0–3 | 1 | 0–1 | 0·25 |
| | marginal | 4–6 | 4·64 | 3–5 | 3·83 | 2–6 | 5 | 3–4 | 3·12 |
| | total | 4–8 | 5·50 | 3–5 | 4·33 | 4–7 | 6 | 3–4 | 3·37 |
| IV | anterior | 11–19 | 15·28 | 10–15 | 12·33 | 12–17 | 14·3 | 7–15 | 12 |
| | marginal | 6–8 | 6·85 | 6–7 | 6·66 | 6–8 | 7·2 | 6–8 | 6·62 |
| | total | 18–26 | 22·14 | 16–22 | 19 | 19–25 | 21·5 | 13–22 | 18·62 |
| V | anterior | 15–23 | 18·07 | 13–18 | 15·66 | 13–20 | 16 | 12–19* | 16·33* |
| | marginal | 6–8 | 6·78 | 7 | 7 | 7–8 | 7·1 | 7–8* | 7·50* |
| | total | 21–31 | 24·85 | 20–25 | 22·66 | 20–27 | 23·1 | 19–26* | 23·83* |
| VI | anterior | 8–16 | 11·50 | 10–13 | 11·66 | 9–13 | 11 | 12–14 | 12·66 |
| | marginal | 4–6 | 5 | 4–5 | 4·83 | 4–6 | 5·2 | 5–7 | 6 |
| | total | 13–21 | 16·50 | 15–18 | 16·50 | 13–18 | 16·2 | 17–20 | 18·66 |
| VII | anterior | 3–6 | 4·28 | 5–6 | 5·50 | 3–8 | 4·80 | 2–5 | 3·62 |
| | marginal | 1–2 | 1·85 | 2 | 2 | 2–4 | 2·40 | 2–3 | 2·75 |
| | total | 4–8 | 6·14 | 7–8 | 7·50 | 5–12 | 7·20 | 4–8 | 6·37 |

* of 6 sides only.

**Table 6.** *Myrsidea* spp.: setae in lateral sternal brushes, male.

| | | *breviterga* | | *meinertzhageni* from *T.fulvus billypayni* | | | | *clamosae* from *T.melanops clamosus* | |
|---|---|---|---|---|---|---|---|---|---|
| | | Each side | Mean (8 sides) | Each side | Mean (10 sides) | Each side | Mean (12 sides) | Each side | Mean (12 sides) |
| III | anterior | 0–1 | 0·75 | 0–1 | 0·60 | 0–1 | 0·58 | 0–3 | 1·83 |
| | marginal | 3–4 | 3·37 | 2–3 | 2·90 | 2–3 | 2·91 | 2–4 | 3·50 |
| | total | 3–5 | 4·12 | 3–5 | 3·50 | 3–5 | 3·50 | 4–7 | 5·33 |
| IV | anterior | 9–14 | 11 | 10–13 | 12 | 10–22 | 13·60 | 10–16 | 13·58 |
| | marginal | 5–6 | 5·62 | 5–7 | 6·50 | 5–7 | 6·58 | 5–8 | 6·66 |
| | total | 15–17 | 16·62 | 17–20 | 18·50 | 17–29 | 20·16 | 17–23 | 20·25 |
| V | anterior | 12–16 | 14·25 | 15–21 | 18·10 | 15–26 | 19·08 | 12–18 | 14·83 |
| | marginal | 6–7 | 6·87 | 6–8 | 7·20 | 6–9 | 7·50 | 6–9 | 6·91 |
| | total | 19–22 | 21·12 | 23–28 | 25·30 | 23–35 | 26·58 | 18–25 | 21·75 |
| VI | anterior | 9–16 | 13·50 | 12–15 | 12·90 | 12–21 | 14·08 | 9–15 | 13 |
| | marginal | 5–7 | 6 | 5–7 | 5·80 | 5–7 | 5·83 | 5–7 | 5·58 |
| | total | 14–22 | 19·5 | 17–20 | 18·70 | 17–27 | 19·91 | 14–21 | 18·58 |
| VII | anterior | 5–8 | 6·75 | 4–7 | 5·30 | 4–7 | 5·41 | 3–9 | 5·50 |
| | marginal | 3 | 3 | 2–3 | 2·40 | 2–3 | 2·33 | 2–3 | 2·83 |
| | total | 8–11 | 9·75 | 6–9 | 7·70 | 6–9 | 7·75 | 5–12 | 8·33 |

**Table 7.** *Myrsidea* spp.: measurements in mm., female.No. of specimens in parenthesis.

| | | *satbhai* from *T.s.striatus* (7) | *satbhai* from *T.melanops vepres* (5) | *bharat* (7) | *chilchil* from *T.c.caudatus* (5) | *chilchil* from *T.squamiceps* (5) | *salimalii* (5) | *breviterga* (2) | *meinertz-hageni* from *T.fulvus billypayni* (5) | *clamosae* from *T.melanops clamosus* (5) |
|---|---|---|---|---|---|---|---|---|---|---|
| Length | | | | | | | | | | |
| Head | Range | 0·32–0·35 | 0·32–0·33 | 0·31–0·35 | 0·31–0·35 | 0·34–0·36 | 0·33–0·34 | 0·33, 0·34 | 0·34–0·36 | 0·31–0·33 |
| | Mean | 0·33 | 0·32 | 0·33 | 0·33 | 0·35 | 0·34 | 0·335 | 0·35 | 0·32 |
| Total | Range | 1·91–2·15 | 1·80–2·00 | 1·91–2·07 | 1·52–1·91 | 1·91–2·00 | 1·60–1·81 | 1·87, 1·91 | 2·00–2·10 | 1·74–1·88 |
| | Mean | 2·03 | 1·88 | 2·01 | 1·71 | 1·95 | 1·73 | 1·89 | 2·03 | 1·80 |
| Breadth | | | | | | | | | | |
| Head[1] | Range | 0·37–0·38 | 0·36 | 0·36–0·38 | 0·32–0·33 | 0·34–0·35 | 0·34–0·35 | 0·34 | 0·34–0·36 | 0·33–0·34 |
| | Mean | 0·375 | 0·36 | 0·36 | 0·325 | 0·345 | 0·34 | 0·34 | 0·35 | 0·34 |
| Head[2] | Range | 0·53–0·57 | 0·52–0·53 | 0·52–0·56 | 0·47–0·49 | 0·49–0·52 | 0·49–0·51 | 0·52, 0·53 | 0·51–0·53 | 0·50–0·53 |
| | Mean | 0·55 | 0·525 | 0·54 | 0·48 | 0·51 | 0·50 | 0·525 | 0·52 | 0·51 |
| Prothorax | Range | 0·32–0·37 | 0·32–0·35 | 0·34–0·37 | 0·29–0·31 | 0·32–0·35 | 0·31–0·32 | 0·33, 0·35 | 0·32–0·33 | 0·32–0·35 |
| | Mean | 0·35 | 0·34 | 0·35 | 0·30 | 0·34 | 0·316 | 0·34 | 0·325 | 0·33 |
| Metanotum | Range | 0·47–0·49 | 0·48–0·50 | 0·48–0·51 | 0·43–0·48 | 0·47–0·51 | 0·47–0·49 | 0·49 | 0·49–0·51 | 0·49–0·50 |
| | Mean | 0·48 | 0·47 | 0·50 | 0·45 | 0·49 | 0·48 | 0·49 | 0·50 | 0·495 |
| Broadest tergum* | Range | 0·80–0·83 | 0·77–0·82 | 0·79–0·83 | 0·61–0·69 | 0·71–0·75 | 0·68–0·70 | 0·72, 0·76 | 0·69–0·79 | 0·71–0·76 |
| | Mean | 0·82 | 0·80 | 0·81 | 0·66 | 0·73 | 0·69 | 0·74 | 0·74 | 0·73 |

Head[1], breadth at widest part anterior to eyes. Head[2], breadth at temples.
* Usually tergum V is the broadest.

**Table 8.** *Myrsidea* spp.: measurements in mm., male. No. of specimens in parenthesis.

| | | *satbhai* from *T.s.striatus* (5) | *satbhai* from *T.melanops vepres* (3) | *bharat* (5) | *chilchil* from *T.c.caudatus* (5) | *chilchil* from *T.squamiceps* (8) | *salimalii* (5) | *breviterga* (4) | *meinertz-hageni* from *Tifulvus billypayni* (5) | *clamosae* from *T.melanops clamosus* (5) |
|---|---|---|---|---|---|---|---|---|---|---|
| Length | | | | | | | | | | |
| Head | Range | 0·30–0·32 | 0·28–0·31 | 0·30–0·32 | 0·29–0·31 | 0·31–0·32 | 0·28–0·29 | 0·28–0·31 | 0·32–0·33 | 0·29–0·31 |
| | Mean | 0·31 | 0·29 | 0·31 | 0·30 | 0·31 | 0·29 | 0·30 | 0·325 | 0·30 |
| Total | Range | 1·55–1·70 | 1·48–1·51 | 1·60–1·77 | 1·36–1·47 | 1·34–1·60 | 1·34–1·39 | 1·45–1·62 | 1·62–1·68 | 1·48–1·65 |
| | Mean | 1·66 | 1·49 | 1·67 | 1·42 | 1·52 | 1·37 | 1·54 | 1·66 | 1·55 |
| Breadth | | | | | | | | | | |
| Head[1] | Range | 0·32–0·35 | 0·32–0·33 | 0·32–0·35 | 0·28–0·31 | 0·29–0·32 | 0·28–0·30 | 0·29–0·31 | 0·31–0·32 | 0·30–0·31 |
| | Mean | 0·33 | 0·325 | 0·33 | 0·29 | 0·30 | 0·29 | 0·30 | 0·32 | 0·305 |
| Head[2] | Range | 0·46–0·50 | 0·46–0·48 | 0·47–0·51 | 0·42–0·44 | 0·43–0·45 | 0·42–0·43 | 0·42–0·46 | 0·46 | 0·44–0·45 |
| | Mean | 0·48 | 0·47 | 0·48 | 0·43 | 0·44 | 0·425 | 0·44 | 0·46 | 0·44 |
| Prothorax | Range | 0·29–0·34 | 0·31–0·33 | 0·31–0·33 | 0·25–0·28 | 0·28–0·30 | 0·26–0·28 | 0·29–0·31 | 0·29–0·30 | 0·29–0·31 |
| | Mean | 0·32 | 0·32 | 0·32 | 0·27 | 0·29 | 0·28 | 0·30 | 0·295 | 0·30 |
| Metanotum | Range | 0·34–0·41 | 0·36–0·38 | 0·38–0·42 | 0·32–0·35 | 0·33–0·36 | 0·30–0·32 | 0·36–0·39 | 0·36–0·37 | 0·32–0·38 |
| | Mean | 0·37 | 0·37 | 0·39 | 0·33 | 0·34 | 0·31 | 0·37 | 0·37 | 0·35 |
| Broadest tergum* | Range | 0·55–0·64 | 0·59 | 0·59–0·68 | 0·46–0·54 | 0·49–0·53 | 0·46–0·49 | 0·54–0·57 | 0·53–0·55 | 0·53–0·57 |
| | Mean | 0·59 | 0·59 | 0·62 | 0·50 | 0·51 | 0·48 | 0·56 | 0·54 | 0·54 |

Head[1], breadth at widest part anterior to eyes. Head[2], breadth at temples.

* Usually tergum V is the broadest.

**Table 9.** *Myrsidea* spp.: length (in mm.) of post-spiracular setae. No. of setae measured in parenthesis.

| | | *satbhai* from *T.s.striatus* | *satbhai* from *T.melanops vepres* (10) | *bharat* (10) | *chilchil* from *T.c.caudatus* (10) | *chilchil* from *T.squamiceps* (10) | *salimalii* (10) | *breviterga* (4) | *meinert-zhageni* from *T.fulvus billypayni* (10) | *clamosae* from *T.melanops clamosus* (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Females | | | | | | | | | | |
| III | Range | 0·18–0·27 | 0·19–0·23 | 0·20–0·31 | 0·12–0·15 | 0·12–0·15 | 0·12–0·15 | 0·15–0·19 | 0·16–0·21 | 0·15–0·21 |
| | Mean | 0·224 (7) | 0·21 | 0·25 | 0·134 | 0·135 (9) | 0·14 | 0·17 | 0·18 | 0·18 |
| V | Range | 0·19–0·25 | 0·15–0·19 | 0·20–0·28 | 0·12–0·14 | 0·12–0·13 | 0·12–0·16 | 0·13–0·16 | 0·14–0·19 | 0·12–0·18 |
| | Mean | 0·215 (10) | 0·17 | 0·24 | 0·127 | 0·126 (10) | 0·133 | 0·14 | 0·163 | 0·15 |
| VI | Range | 0·43–0·46 | 0·32–0·38 | 0·36–0·44 | 0·29–0·35 | 0·29–0·38 | 0·29–0·38 | 0·20–0·34 | 0·28–0·35 | 0·26–0·35 |
| | Mean | 0·44 (4) | 0·36 | 0·40 | 0·32 | 0·33 (7) | 0·317 | 0·29 | 0·32 | 0·30 |
| Males | | | (6) | (10) | (10) | (10) | | (7) | (10) | (10) |
| III | Range | 0·16–0·19 | 0·14–0·18 | 0·16–0·22 | 0·09–0·15 | 0·11–0·16 | 0·12–0·14 | 0·16–0·20 | 0·13–0·16 | 0·14–0·18 |
| | Mean | 0·17 (7) | 0·16 | 0·18 | 0·126 | 0·13 | 0·13 (10) | 0·18 | 0·146 | 0·156 |
| V | Range | 0·13–0·16 | 0·11–0·13 | 0·13–0·22 | 0·10–0·14 | 0·11–0·13 | 0·11–0·12 | 0·12–0·15 | 0·12–0·15 | 0·13–0·16 |
| | Mean | 0·15 (7) | 0·12 | 0·16 | 0·121 | 0·12 | 0·117 (8) | 0·13 | 0·13 | 0·142 |
| VI | Range | 0·38–0·43 | 0·31–0·40 | 0·32–0·36 | 0·12–0·23 | 0·13–0·31 | 0·13–0·25 | 0·23–0·32 | 0·14–0·30 | 0·18–0·28 |
| | Mean | 0·41 (4) | 0·34 | 0·33 | 0·17 | 0·23 | 0·18 (10) | 0·27 | 0·19 | 0·232 |