

## **CHAPTER-IV**

## **TAXONOMY**

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**FAMILY: GRYLLOTALPIDAE**

The family Gryllotalpidae is characterized by

- 1) Elongate body, head small and conical.
- 2) Ocelli two.
- 3) Pronotum shape convex.
- 4) Fore leg with coxa very short, femur somewhat curved; tibia very short, triangular its apical spurtransformed into strong, cutting dactyli.
- 5) There is no mirror and the disk of the tegmina occupied by a large triangular cell.
- 6) In female ovipositor is completely aborted.

The family Gryllotalpidae is represented by two genera, *Scapteriscus* Scudder and *Gryllotalpa* Latreille.

**KEY TO THE GENERA OF GRYLLOTALPIDAE**

Anterior tibiae armed with two dactyls.....  
.....**Scapteriscus** Scudder  
Anterior tibiae armed with four dactyls.....  
.....**Gryllotalpa** Latreille

## GENUS GRYLLOTALPA LATREILLE

The genus *Gryllotalpa* was erected by Latreille in 1802 with the help of type species *Gryllus* (*Acheta*) *gryllotalpa* L. (*Gryllotalpa* Latreille, *Hist. nat. Crust. Ins.* 111, 275, 1802). The genus is distributed in Europe, Asia, Africa, Australia and Newzeland. From this genus six species have been reported from India (Chopard, 1969; Awate and Sathe, 2007). In past, Chopard, 1928a, 1928b, 1933a, 1933b, 1935, 1951, 1969; Pantel, 1896; Sandrasagara, 1954; Vasanth, 1993; Awate and Sathe, 2007, etc studied the genus from India.

## KEY TO THE SPECIES OF GRYLLOTALPA

1. Very large species (40-50mm).....  
.....***hirsuta* Burmeister**
- Species of medium size (20-30 mm).....2
2. Body of a velvet blackish colour with rofous legs.....***fulvipes* Saussure**
- Body length more than 30 and less than 40, Ovipositor vestigial.....***vestigi* sp. nov.**
- Colour uniformly of a more or less dark brown.....3

3. Shape very narrow; dark brown; ♀, veins of tegmina very close, parallel, not at all deviated at base; ♂, mirror very narrow.....***ornata***

**Walker**

- Mirror reduced; tegmina extended to the 3<sup>rd</sup> segment of abdominal tergite, genitalia structure, inferior hook short, blunt.....***indica* sp. nov.**
- Four spines on mid leg tibia, pronotal plate quadrangular basally, parallel sided, tapering anteriorly.....***shivajiensis* sp. nov.**
- Tegmina extended to the 4<sup>th</sup> abdominal tergite, small sized mirror present.... ***micromi* sp. nov.**

***GRYLLOTALPA INDICA* SP. NOV.****MALE (Fig. 25):**

35.00 mm long excluding anal appendages, body colour uniformly dark brown, head 6.00 mm long, thorax 16.00 mm long, tegmina 14.00 mm long, hind wing 27.00 mm long; abdomen 13.00 mm long, dark brown; anal cerci 11.00 mm long, dark brown.

**HEAD:**

6.00 mm long, 5.00 mm broad, roundedly triangular; occiput dark brown, hairy; compound eyes black, ocular distance 1.16 mm, interocular distance 2.08 mm; ocelli 2, yellowish, semicircular, ocellar distance 0.34 mm, interocellar distance 0.78 mm; face hairy, antennae on frontal rostrum; clypeus dark brown to blackish, triangular, 1.08 mm long, 1.12 mm broad; labrum dark brown, semicircular, 1.33 mm long, 1.54 mm broad;

maxillary palpi dark brown, 4.00 mm long, 0.55 mm broad, 5 segmented.

**Antenna (Fig. 26):**

11.00 mm long, 0.50 mm broad, reddish brown, antennal margin dark brown; scape 0.41 mm long, 0.50 mm broad, hairy; pedicel 0.21 mm long, 0.26 mm broad; flagellum 112 segmented, 10.38 mm long, 0.20 mm broad; 1<sup>st</sup> segment 0.17 mm long, 0.20 mm broad; 15<sup>th</sup> segment 0.07 mm long, 0.18 mm broad; terminal segment 0.07 mm long, 0.05 mm broad.

**Flagellar formula:**

$1=L/W=0.85$ ,  $15=L/W=0.38$ ,  $Ts=L/W=1.4$ ,  $A=0.87$

**THORAX:**

16.00 mm long, 8.00 mm broad, dark brown, densely hairy, pronotum with regularly convex side, pronotum not acutely tapering towards anterior, disk and lateral lobes separated by strongly marked humeral edge, lateral lobes rectangular.

**Tegmina (Fig. 27):**

14.00 mm long, 8.00 mm broad, dark brown, short, wide, extended to the 3<sup>rd</sup> abdominal tergite, mirror very narrow and reduced, oblique vein very much reduced, diagonal vein long, dark brown, subcosta bearing 10 branches.

**Hind wing (Fig. 28):**

27.00 mm long, 13.00 mm broad, dark brown, wings very long, longer than tegmina.

**Legs:**

Fore leg, hind leg similar to body colour, mid leg lighter than body colour.

**Fore leg:**

14.60 mm long, 5.00 mm broad; coxa 3.00 mm long, 5.00 mm broad, dark brown, hairy at outer margin; trochanter 2.00 mm long, 2.00 mm broad, dark brown to blackish, curved spine at the tip of trochanter, densely hairy; femur stoutly builded,

6.00 mm long, 3.00 mm broad, velvet dark brown, densely hairy at outer, margin; tibia 3.00 mm long, 3.00 mm broad, velvet dark brown, densely hairy at outer margin, tibia long, armed, modified into 4 tibial dactyls, dactyls long and narrow, 1<sup>st</sup> tibial dactyl 0.97 mm long, 0.71 mm broad; 2<sup>nd</sup> tibial dactyl 1.26 mm long, 0.56 mm broad; 3<sup>rd</sup> tibial dactyl 3.00 mm long, 0.47 mm broad; 4<sup>th</sup> tibial dactyl 0.60 mm long, 0.38 mm broad, dark brown, sparsely hairy; claw dark brown.

**Mid leg:**

20.73 mm long, 4.00 mm broad, coxa 3.00 mm long, 4.00 mm broad, yellowish brown, hairy at outer margin; trochanter 1.73 mm long, 1.65 mm broad, yellowish brown, densely hairy at outer margin; femur stoutly builded, 6.00 mm long, 1.32 mm broad, yellowish brown, densely hairy; tibia 5.00 mm long, 1.16 mm broad, yellowish brown, narrow, slender, 2 reddish brown tibial spines at tip, outer margin densely hairy; tarsus 3 segmented, 5.00 mm long, 0.48 mm broad, yellowish brown, densely hairy; 1<sup>st</sup> tarsal segment 1.65 mm long, 0.48 mm broad; 2<sup>nd</sup> tarsal segment 0.74 mm long, 0.4 mm broad; 3<sup>rd</sup> tarsal segment



0.74 mm long, 0.34 mm broad; claw reddish dark brown.

**Hind leg:**

25.04 mm long, 4.00 mm broad; coxa 3.00 mm long, 4.00 mm broad, dark brown, hairy at outer margin; trochanter 1.04 mm long, 1.56 mm broad, yellowish brown, outer margin densely hairy; femur 9.00 mm long, 3.00 mm broad, dark brown, densely hairy; tibia long, narrow, slender, 7.00 mm long, 1.13 mm broad, dark brown, 6 reddish brown tibial spines, densely hairy; tarsus 3 segmented, 5.00 mm long, 0.69 mm broad, dark brown, densely hairy; metatarsus armed with 2 curved spines; 1<sup>st</sup> tarsal segment 1.39 mm long, 0.55 mm broad; 2<sup>nd</sup> tarsal segment 0.74 mm long, 0.52 mm broad; 3<sup>rd</sup> tarsal segment 1.65 mm long, 0.46 mm broad, metatarsus armed with 2 curved spines; claw dark reddish brown.

**ABDOMEN:**

13.00 mm long, 5.00 mm broad, tapering to posterior side, dark brown, 10 segmented; anal cerci

(fig. 29) 11.00 mm long, cerci with long hairs, dark brown.

**Genitalia (Fig. 30 and 31):**

Inferior hooks short, blunt; superior part of pseudepiphallus dark brown, 1.05 mm long, 0.12 mm broad; inferior part of pseudepiphallus dark brown, 1.29 mm long, 0.27 mm broad, lateral rod dark brown 0.83 mm long, 0.66 mm broad.

**COLOUR:**

**Dark brown:** Clypeus, labrum, maxillary palpi, occiput, antennal margin, thorax, tegmina, hind wing, fore leg coxa, claw, hind leg coxa, femur, tibia, genitalia.

**Black:** Compound eyes.

**Dark brown:** Thorax, tegmina, mid leg tibia, hind wing, hind leg coxa, trochanter, femur, abdomen, anal cerci.

**Yellowish brown:** Fore leg coxa, mid leg coxa, trochanter, femur, tarsus, hind leg tibia, tarsus.

**Reddish brown:** Antennae, spines of fore leg trochanter, mid leg tibial spines, claw.

**Velvet dark brown:** Fore leg femur, tibia.

**Dark reddish to black:** Fore leg tibial dactyl.

**HOLOTYPE:** Male, India, Maharashtra, Coll. 20-X-2006; Awate Manisha; antenna, wings, cerci, genitalia on slide labeled as above; other parts with pinned form, labeled as above.

**PARATYPE:** 5 ♂, 0 ♀, Coll. from 10-VII-2006 to 10-X-2007.

**DISTRIBUTIONAL RECORD:** 1 ♂ Shahuwadi, 6-VII-2006; 2 ♂ Gaganbawada, 24-IX-2006; 1 ♂ Kolhapur, 2-X-2006; 1♂ Bhudargad, 15-VI-2007; 1♂ Karveer, 29-VII-2007.

## ETYMOLOGY

*Gryllotalpa indica* sp. nov. has been reported from India for the first time, hence the name.

## REMARKS

According to Chopard's (1969) key *Gryllotalpa indica* sp. nov. runs close to *Gryllotalpa ornata* Walk by having following characters.

- 1) Body medium sized.
- 2) Body colour dark brown.
- 3) Pronotum with regularly convex side.

However, it differs from the above species by having following characters.

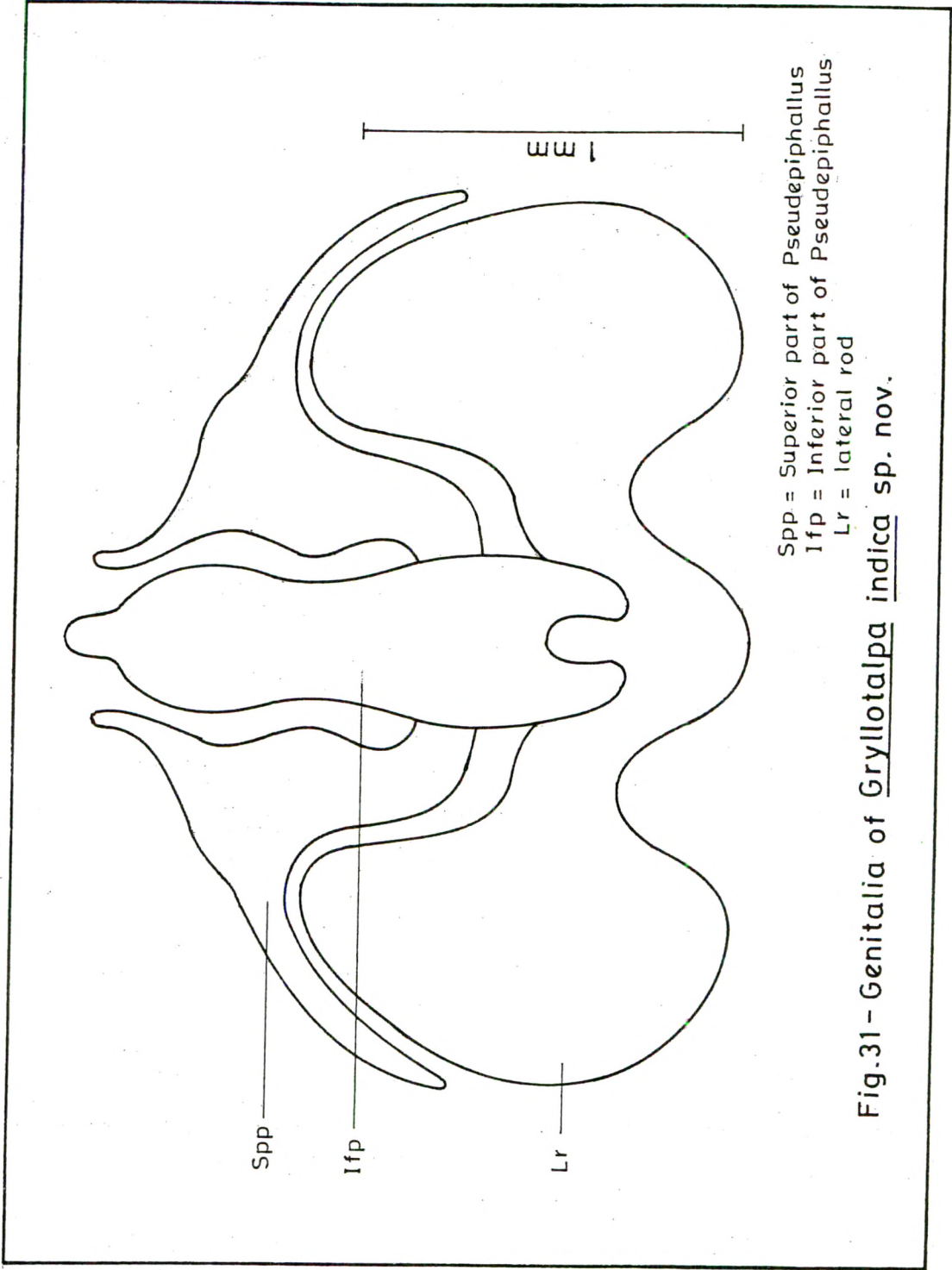
- 1) Tegmina extending to the apex of 3<sup>rd</sup> segment of abdominal tergite and not 6<sup>th</sup> abdominal tergite as noticed in *G.ornata*.
- 2) Subcosta bearing 10 branches.
- 3) Genitalia structure, inferior hook short, blunt.
- 4) Tibial dactyls long and narrow.
- 5) Flagellar formula:  
 $1=L/W=0.85$ ,  $15=L/W=0.38$ ,  $Ts=L/W=1.4$ ,  $A=0.87$
- 6) Mirror reduced.
- 7) Cerci with long hairs.

8) Ocelli semicircular.

9) Pronotum not acutely tapering towards anterior.



PLATE – 5: *Gryllotalpa indica* sp.nov. Fig.25: Adult Male  
 Fig. 26: Antenna Fig.27: Tegmina Fig. 28: Hind wing  
 Fig. 29: Anal cerci Fig. 30: Genitalia



Spp = Superior part of Pseudepiphallus  
Ifp = Inferior part of Pseudepiphallus  
Lr = lateral rod

Fig.31 - Genitalia of Gryllotalpa indica sp. nov.

***GRYLLOTALPA VESTIGI* SP. NOV.****FEMALE (Fig. 32):**

36.00 mm long excluding anal appendages, body velvet blackish, head 6.00 mm long, thorax 15.00 mm long, tegmina 13.00 mm long, hind wing 26.00 mm long; abdomen 15.00 mm long, dark brown; anal cerci 6.00 mm long, dark brown.

**HEAD:**

6.00 mm long, 4.00 mm broad, roundedly triangular; occiput dark brown; compound eyes dark black, ocular distance 1.00 mm, interocular distance 3.00 mm; ocelli 2, yellowish white, semicircular, ocellar distance 0.38 mm, interocellar distance 0.86 mm; face hairy; antennae on frontal rostrum; clypeus dark brown to blackish, triangular, circular, 0.66 mm long, 1.08 mm broad; labrum yellowish to dark brown, semicircular, 0.85 mm long, 1.29 mm broad; maxillary palpi dark brown, cylindrical, 3.00 mm long, 0.33 mm broad, 5 segmented.



**Antenna (Fig. 33):**

9.00 mm long, 0.42 mm broad, dark brown, black margin on antennal segment; scape 0.50 mm long, 0.42 mm broad; pedicel 0.20 mm long, 0.25 mm broad; flagellum 87 segmented, 8.3 mm long, 0.15 mm broad; 1<sup>st</sup> segment 0.14 mm long, 0.18 mm broad; 15<sup>th</sup> segment 0.08 mm long, 0.15 mm broad; terminal segment 0.08 mm long, 0.07 mm broad.

**Flagellar formula:**

$1=L/W=0.77, 15=L/W=0.53, Ts=L/W=1.14, A=0.81$

**THORAX:**

15.00 mm long, 8.00 mm broad, velvet dark brown, pronotum with regularly convex side, broad posteriorly, flat disk and lateral lobes separated by strongly marked humeral edge, rectangular.

**Tegmina (Fig. 34):**

13.00 mm long, 7.00 mm broad, dark brown, long, narrow, extended to the 3<sup>rd</sup> abdominal tergite; subcosta bearing 8 branches.

**Hind wing (Fig.35):**

26.00 mm long, 12.00 mm broad, dark brown, wings very long, longer than tegmina.

**Legs:**

Fore leg, mid leg lighter than body colour; hind leg darker than body colour.

**Fore leg:**

14.75 mm long, 4.00 mm broad; coxa 3.00 mm long, 4.00 mm broad, yellowish brown; trochanter 3.00 mm long, 2.00 mm broad, reddish brown, hairy, reddish brown spine at tip; femur stoutly builded, 5.00 mm long, 3.00 mm broad, velvete dark brown, densely hairy at inner margin; tibia 3.00 mm long, 2.00 mm broad, velvet dark brown, densely hairy at inner margin; tibia modified into 4

tibial dactyls, dactyls short and wide; 1<sup>st</sup> tibial dactyl 0.91 mm long, 0.58 mm broad; 2<sup>nd</sup> tibial dactyl 1.00 mm long, 0.44 mm broad; 3<sup>rd</sup> tibial dactyl 1.75 mm long, 0.78 mm broad; 4<sup>th</sup> tibial dactyl 0.75 mm long, 0.33 mm broad, reddish brown at tip densely hairy; claw reddish brown.

**Mid leg:**

16.66 mm long, 3.00 mm broad; coxa 2.00 mm long, 3.00 mm broad, yellowish brown; trochanter 2.00 mm long, 2.00 mm broad, yellowish brown, densely hairy; femur 5.00 mm long, 1.05 mm broad, yellowish brown, densely hairy; tibia 5.00 mm long, 2.00 mm broad, dark brown, densely hairy, 4 reddish brown tibial spines; tarsus 3 segmented, 2.66 mm long, 0.33 mm broad, yellowish brown; 1<sup>st</sup> tarsal segment 1.04 mm long, 0.33 mm broad; 2<sup>nd</sup> tarsal segment 0.62 mm long, 0.33 mm broad; 3<sup>rd</sup> tarsal segment 1.00 mm long, 0.20 mm broad; claw dark brown.

**Hind leg:**

24.00 mm long, 2.00 mm broad, coxa 2.00 mm long, 2.00 mm broad, yellowish brown; trochanter 1.00 mm long, 2.00 mm broad, dark brown, outer margin densely hairy; femur 9.00 mm long, 3.00 mm broad, dark velvet brown, densely hairy; tibia 7.00 mm long, 1.00 mm broad, velvet dark brown, 10 reddish brown tibial spines, densely hairy; tarsus 3 segmented, 5.00 mm long, 0.5 mm broad, yellowish brown; 1<sup>st</sup> tarsal segment 1.54 mm long, 0.37 mm broad; 2<sup>nd</sup> tarsal segment 0.69 mm long, 0.45 mm broad; 3<sup>rd</sup> tarsal segment 1.58 mm long, 0.45 mm broad; claw reddish brown.

**ABDOMEN:**

15.00 mm long, 7.00 mm broad, tapering to posterior side, dark brown, 9 segmented; anal cerci (fig. 36) 6.00 mm long, hairy, yellowish brown; ovipositor vestigial.

**COLOUR:**

**Dark brown:** Occiput, antenna, maxillary palpi, tegmina, mid leg femur, hind leg trochanter, abdomen.

**Dark black:** Compound eyes.

**Dark brown to blackish:** Clypeus

**Yellowish white:** Ocelli.

**Velvet dark brown:** Pronotum, fore leg femur, tibia, hind leg femur, tibia.

**Yellowish brown:** Fore leg coxa, mid leg coxa, trochanter, femur, mid leg tarsus, hind leg coxa, tarsus, anal cerci.

**Yellowish to dark brown:** Labrum.

**Reddish brown:** Fore leg trochanter, spine of trochanter, femur, tibia, tibial dactyls, claw, hind leg claw.

**HOLOTYPE** : Female, India, Maharashtra, Coll. 26-2006; Awate Manisha; antenna, wings, cerci on slide labeled as above; other parts with pinned form, labeled as above.

**PARATYPE** : 10 ♂, 0 ♀, Coll. from 4-VI-2006 to 30-XI-2007.

**DISTRIBUTIONAL RECORD:** 2 ♂ Radhanagari, 18-VI-2006; 3 ♂ Panhala, 23-VII-2006; 3 ♂ Ajara, 20 - VIII - 2007; 1 ♂ Kagal, 16-IX-2007; 1 ♂ Karveer, 24-XI-2007.

### **ETYMOLOGY**

*Gryllotalpa vestigi* sp. nov. ovipositor in the species is vestigial hence the name.

## REMARKS

According to Chopard's (1969) key *Gryllotalpa vestigi* sp. nov. runs close to *Gryllotalpa fulvipes* Sassuure by having following characters.

- 1) Body velvet blackish.
- 2) Rufous legs.

However, it differs from the above species by having following characters.

- 1) Body length longer than *G. fulvipes*.
- 2) Wing proportion ( $L \times W$ ).
- 3) Flagellar formula:  
 $1=L/W=0.77, 15=L/W=0.53, Ts=L/W=1.14, A=0.81$
- 4) Ovipositor vestigial.
- 5) Shape and proportion of dactyls on fore leg.

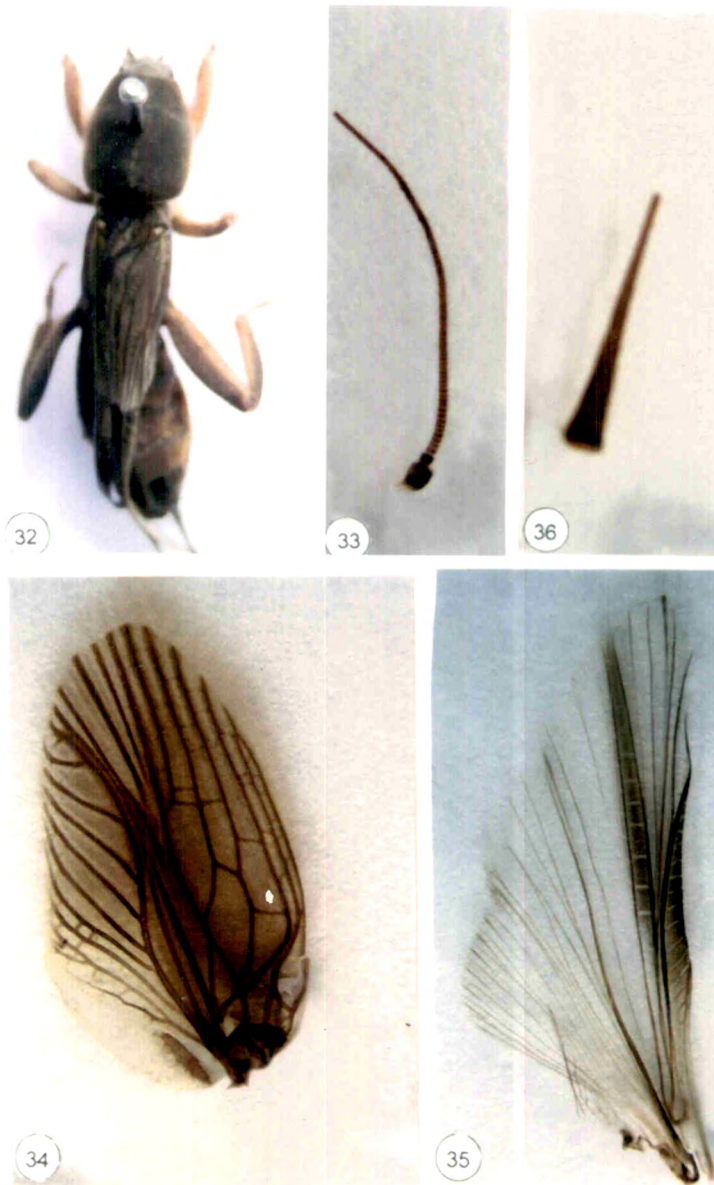


PLATE-6: *Gryllotalpa vestigi* sp. nov. Fig.32: Adult Female Fig.33: Antenna Fig.34: Tegmina Fig. 35: Hind wing Fig. 36: Anal cerci



***GRYLLOTALPA SHIVAJIENSIS* SP. NOV.****MALE (Fig. 37):**

32.00 mm long excluding anal appendages, body colour not uniformly dark brown, head 5.00 mm long, thorax 14.00 mm long, tegmina 12.00 mm long, hind wing 27.00 mm long; abdomen 13.00 mm long, dark brown; anal cerci 11.00 mm long, yellowish brown to dark brown.

**HEAD:**

5.00 mm long, 5.00 mm broad, roundedly triangular; occiput dark brown to black, hairy; compound eyes dark black, ocular distance 1.00 mm, interocular distance 2.00 mm; ocelli 2, yellowish, semicircular, ocellar distance 0.38 mm, interocellar distance 0.71 mm; face hairy; antennae on frontal rostrum; clypeus dark brown, triangular, 1.00 mm long, 0.58 mm broad; labrum, yellowish brown, circular, 1.75 mm long, 1.29 mm broad;

the tip of trochanter, densely hairy; femur stoutly built, 6.00 mm long, 3.00 mm broad, velvet dark brown, densely hairy at outer margin; tibia 4.00 mm long, 3.00 mm broad, velvet light dark brown, densely hairy at outer margin; tibia long, armed, modified into 4 tibial dactyls; dactyls long and narrow, dark reddish to black at tip; 1<sup>st</sup> tibial dactyl 0.90 mm long, 0.54 mm broad; 2<sup>nd</sup> tibial dactyl 1.4 mm long, 0.66 mm broad; 3<sup>rd</sup> tibial dactyl 2.1 mm long, 0.70 mm broad; 4<sup>th</sup> tibial dactyl 0.74 mm long, 0.4 mm broad, dark brown, sparsely hairy; claw reddish brown.

**Mid leg:**

17.00 mm long, 2.00 mm broad; coxa 2.00 mm long, 2.00 mm broad, yellowish brown, hairy at outer margin; trochanter 2.00 mm long, 1.00 mm broad, yellowish brown, sparsely hairy; femur stoutly built, 5.00 mm long, 1.12 mm broad, dark brown, densely hairy; tibia narrow, slender 4.00 mm long, 1.00 mm broad, 4 dark reddish brown tibial spines at tip, outer margin densely hairy; tarsus 3 segmented, 4.00 mm long, 0.32 mm broad, yellowish brown, hairy; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.44 mm broad; 2<sup>nd</sup> tarsal segment

1.2 mm long, 0.35 mm broad; 3<sup>rd</sup> tarsal segment 0.5 mm long, 0.47 mm broad; claw reddish brown.

**Hind leg:**

23.00 mm long, 3.00 mm broad; coxa 2.00 mm long, 3.00 mm broad, dark brown, outer margin densely hairy; trochanter 2.00 mm long, 2.00 mm broad, dark brown, outer margin densely hairy; femur 9.00 mm long, 3.00 mm broad, dark brown to blackish, densely hairy; tibia long, narrow, slender, 5.00 mm long, 0.95 mm broad, yellowish brown, 10 reddish brown tibial spines, densely hairy; tarsus 3 segmented, 5.00 mm long, 0.41 mm broad, yellowish brown, densely hairy; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.5 mm broad; 2<sup>nd</sup> tarsal segment 1.00 mm long, 0.46 mm broad; 3<sup>rd</sup> tarsal segment 2.00 mm long, 0.41 mm broad; claw dark reddish brown.

**ABDOMEN:**

13.00 mm long, 6.00 mm broad, tapering to posterior side, dark brown to blackish, 10 segmented; anal cerci (fig. 41) 11.00 mm long, hairy, yellowish brown to dark brown.

**Genitalia (Fig.42 and 43):**

Superior part of pseudepiphallus, yellowish brown, 1.33 mm long, 0.16 mm broad; inferior part of pseudepiphallus dark brown, 1.16 mm long, 0.20 mm broad; lateral rod yellowish brown, 1.62 mm long, 0.58 mm broad.

**COLOUR :**

**Dark brown to black:** Occiput, fore leg trochanter, abdomen.

**Black:** Compound eyes.

**Yellowish to dark brown:** Antennae, anal cerci.

**Dark brown:** Clypeus, thorax, tegmina, mid leg tibia, hind wing, spine of fore leg trochanter, hind leg coxa, trochanter, femur, 4<sup>th</sup> tibial dactyl.

**Yellowish brown:** Labrum, maxillary palpi, fore leg coxa, mid leg coxa, trochanter,

femur, tarsus, hind leg tibia, tarsus,  
genitalia.

**Reddish brown:** Mid leg tibial spines, claw.

**Velvet dark brown:** Fore leg femur, tibia.

**Dark reddish to black:** 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> fore leg tibial  
dactyl.

**HOLOTYPE:** Male, India, Maharashtra, Coll.

19-X-2006; Awate Manisha;

antenna, wings, cerci, genitalia on

slide labeled as above; other parts

with pinned form, labeled as above.

**PARATYPE:** 5 ♂, 0 ♀, Coll. from 10-VII-2006 to

10- X -2007.

**DISTRIBUTIONAL RECORD:** 1♂ Gaganbawda,

15-VIII-2006; 1♂ Hatkangale,

31-VIII-2006; 1♂ Kolhapur, 5-IX-

2006; 2♂ Radhanagari, 3-VI- 2007.

## ETYMOLOGY

The name *Gryllotalpa shivajiensis* sp. nov. given to the species is the honour to our beloved institute, Shivaji University, Kolhapur.

## REMARKS

According to the key of Chopard's (1969)

*Gryllotalpa shivajiensis* sp. nov. runs close to *Gryllotalpa ornata* Walk., the species also runs close to *Gryllotalpa indica* sp. nov. by having following characters.

- 1) Body medium sized.
- 2) Body colour not uniformly dark brown.
- 3) Tegminal venation.
- 4) Clypeus and thorax dark brown.

However, it differs from above two species by having following characters.

- 1) Tibial proportion length  $\times$  width.
- 2) 1<sup>st</sup> tibial dactyl proportion length  $\times$  width.
- 3) 3<sup>rd</sup> tibial dactyl proportion length  $\times$  width.
- 4) Mid leg trochanter proportion length  $\times$  width.
- 5) Mid leg tibial spines number (four spines present instead of two).



PLATE - 7: *Gryllotalpa shivajiensis* sp.nov. Fig. 37: Adult Male Fig. 38: Antenna Fig.39: Tegmina Fig.40: Hind wing Fig. 41: Anal cerci Fig. 42: Genitalia

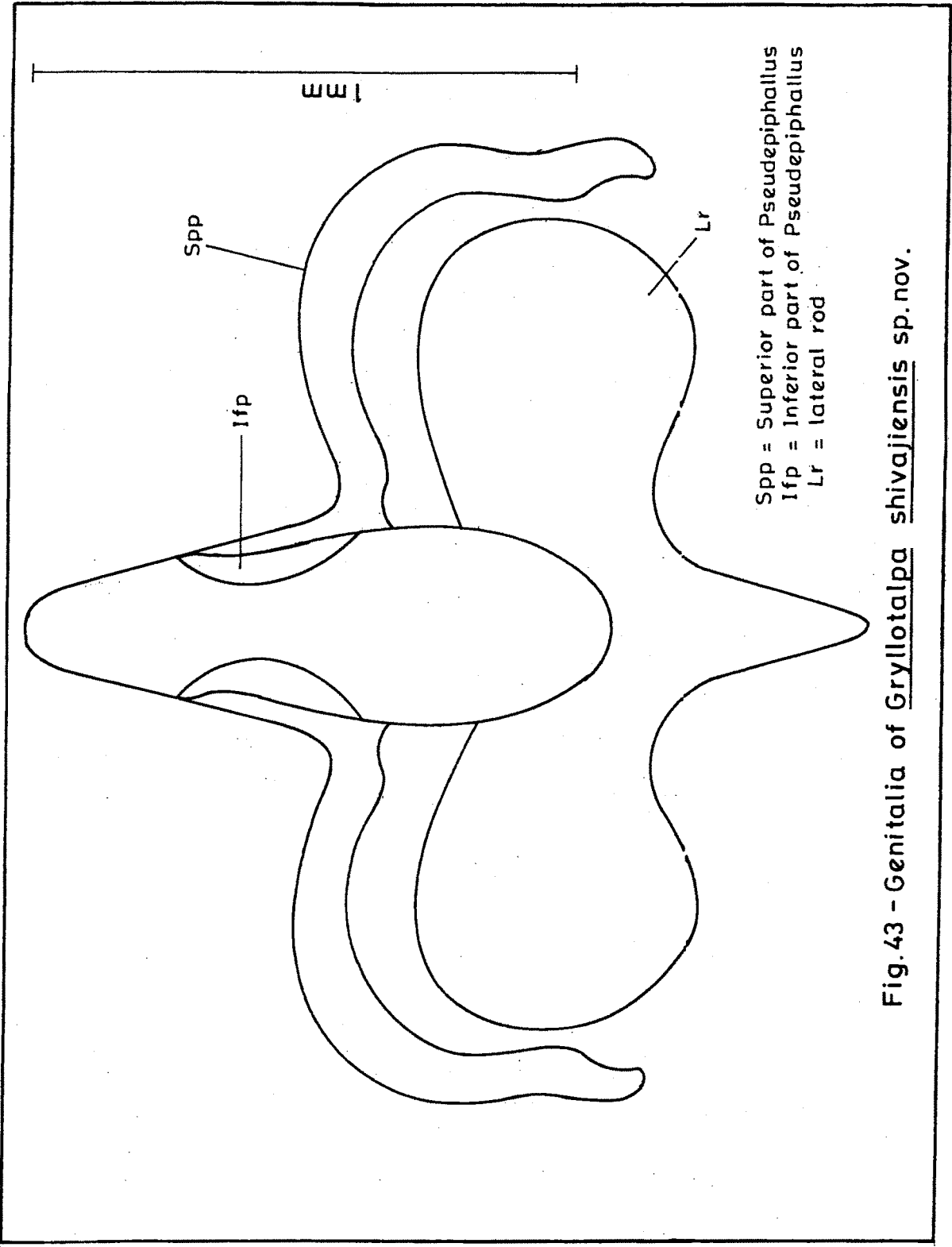


Fig.43 - Genitalia of *Gryllotalpa shivajiensis* sp. nov.



- 6) 1<sup>st</sup> tarsal segment proportion length  $\times$  width.
- 7) Abdominal proportion length  $\times$  width.
- 8) Genitalia lateral rod proportion length  $\times$  width.
- 9) Pronotal plate more or less quadrangular, parallel sided, basally tapering anteriorly.
- 10) Flagellar formula:  
 $1=L/W=0.75, 15=L/W=0.53, Ts=L/W=1.2, A=0.82$
- 11) Subcosta bearing 9 branches.

***GRYLLOTALPA MICROMI* SP. NOV.****MALE (Fig. 44):**

31.00 mm long excluding anal appendages, body more or less uniformly dark brown, shape more narrow, head 4.00 mm long, thorax 15.00 mm long, tegmina 13.00 mm long, hind wing 26.00 mm long; abdomen 12.00 mm long, dark brown; anal cerci 9.00 mm long, yellowish brown.

**HEAD:**

4.00 mm long, 4.00 mm broad, roundedly triangular, occiput dark brown, hairy, compound eyes dark black, ocular distance 0.75 mm, interocular distance 2.00 mm; ocelli 2, yellowish, semicircular, ocellar distance 0.26 mm, interocellar distance 0.60 mm; antennae on frontal rostrum, face hairy; clypeus blackish, semicircular, 0.66 mm long, 0.70 mm broad; labrum dark brown, semicircular, 0.68 mm long, 1.01 mm broad;

maxillary palpi dark brown, cylindrical, 4.00 mm long, 0.50 mm broad, 5 segmented.

**Antenna: (Fig. 45):**

10.00 mm long, 0.38 mm broad, yellowish to dark brown, antennal margin dark brown; scape 0.36 mm long, 0.45 mm broad, hairy; pedicel 0.22 mm long, 0.29 mm broad; flagellum 97 segmented, 9.42 mm long, 0.18 mm broad; 1<sup>st</sup> segment 0.14 mm long, 0.18 mm broad; 15<sup>th</sup> segment 0.07 mm long, 0.14 mm broad; terminal segment 0.07 mm long, 0.05 mm broad.

**Flagellar formula:**

$1=L/W=0.77, 15=L/W=0.50, Ts=L/W=1.40, A=0.89.$

**THORAX:**

15.00 mm long, 7.00 mm broad, velvet dark brown, densely hairy, pronotum with regularly convex side, lateral lobes separated by strongly marked humeral edge, triangular.

**Tegmina (Fig. 46):**

Small, narrow, extended to the 4<sup>th</sup> abdominal tergite, small sized mirror, 13.00 mm long, 7.00 mm broad, dark brown, subcosta bearing 9 branches.

**Hind wing (Fig. 47):**

26.00 mm long, 11.00 mm broad, dark brown, wings very long, longer than tegmina.

**Legs:**

Fore legs, mid leg lighter than body colour, hind leg darker than body colour.

**Fore leg:**

13.00 mm long, 3.00 mm broad; coxa 3.00 mm long, 3.00 mm broad, hairy, yellowish brown; trochanter 2.00 mm long, 2.00 mm broad, yellowish brown, reddish brown spine at the tip of trochanter, densely hairy; femur stoutly builded, 5.00 mm long, 3.00 mm broad, velvet dark brown, densely hairy at outer margin; tibia 3.00 mm long, 3.00 mm broad, velvet dark brown, densely hairy, tibia long, armed, modified into 4 tibial dactyls, dactyls long and narrow; 1<sup>st</sup> tibial dactyl 0.89 mm long, 0.58 mm

broad; 2<sup>nd</sup> tibial dactyl 1.2 mm long, 0.60 mm broad; 3<sup>rd</sup> tibial dactyl 2.10 mm long, 0.75 mm broad; 4<sup>th</sup> tibial dactyl 0.68 mm long, 0.40 mm broad, bifurcated, dark reddish brown; claw reddish brown.

**Mid leg:**

16.47 mm long, 3.00 mm broad; coxa 2.00 mm long, 3.00 mm broad, yellowish brown, hairy; trochanter 1.47 mm long, 1.56 mm broad, yellowish brown, hairy; femur stoutly builded, 4.00 mm long, 1.13 mm broad, dark brown, densely hairy; tibia 5.00 mm long, 1.04 mm broad, narrow, slender, 3 dark reddish brown tibial spines at tip, dark brown, hairy; tarsus 3 segmented, 4.00 mm long, 0.46 mm broad, yellowish brown, hairy; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.5 mm broad; 2<sup>nd</sup> tarsal segment 0.37 mm long, 0.45 mm broad; 3<sup>rd</sup> tarsal segment 1.33 mm long, 0.39 mm broad; claw reddish brown.

**Hind leg:**

19.69 mm long, 2.00 mm broad; coxa 2.00 mm long, 2.00 mm broad, dark brown, hairy;

trochanter 0.69 mm long, 1.04 mm broad, yellowish brown, outer margin densely hairy; femur 7.00 mm long, 3.00 mm broad, dark brown, densely hairy; tibia long, narrow, slender, 6.00 mm long, 1.00 mm broad, dark brown, 8 tibial spines, densely hairy; tarsus 3 segmented, 4.00 mm long, 0.60 mm broad, dark brown, densely hairy; 1<sup>st</sup> segment 1.77 mm long, 0.60 mm broad; 2<sup>nd</sup> segment 0.69 mm long, 0.45 mm broad; 3<sup>rd</sup> segment 1.2 mm long, 0.48 mm broad; claw dark reddish brown.

#### **ABDOMEN:**

12.00 mm long, 6.00 mm broad, tapering to posterior side, dark brown, 10 segmented; anal cerci (fig.48) 10.00 mm long, hairy, yellowish brown.

#### **Genitalia (Fig. 49 and 50):**

Superior part of pesudepiphallus 1.56 mm long, 0.08 mm broad, yellowish brown; inferior part of pesudepiphallus 0.5 mm long, 0.3 mm broad, yellowish brown; lateral rod 1.00 mm long, 0.41 mm broad.

**COLOUR:**

**Dark brown:** Occiput, labrum, maxillary palpi, tegmina, hind wing, mid leg femur, tibia, hind leg coxa, femur, tibia, tarsus, abdomen.

**Black:** Compound eyes.

**Blackish:** Clypeus

**Yellowish:** Ocelli.

**Yellowish to dark brown:** Antennae.

**Velvet dark brown:** Thorax, fore leg femur, tibia.

**Yellowish brown:** Fore leg coxa, trochanter, mid leg coxa, trochanter, tarsus, hind leg trochanter, anal cerci, genitalia.

**Reddish brown:** Claw.

**HOLOTYPE:** Male, India, Maharashtra, Coll.10-X-2006; Awate Manisha; antenna, wings, cerci, genitalia on slide

labelled as above; other parts with  
pinned form, labelled as above.

**PARATYPE:** 6 ♂, 0 ♀, Coll. from 3-VI-2006 to  
10-X- 2007.

**DISTRIBUTIONAL RECORD:** 1♂ Kagal,  
29-VI- 2006; 1♂ Gaganbawada,  
15-VIII-2006; 1♂ Kolhapur,  
10-X-2006; 2♂ Ajara, 26-XI-2006;  
1♂ Shirol, 8-VII-2007.

### ETYMOLOGY

The name *Gryllotalpa micromi* sp. nov. given to  
the species due to the micromirror.

### REMARKS

According to the key of Chopard's (1969)

*Gryllotalpa micromi* sp. nov. runs close to  
*Gryllotalpa ornata* Walk. by having following  
characters.

- 1) Body colour more or less uniformly dark brown.
- 2) Occiput dark brown, compound eyes black.



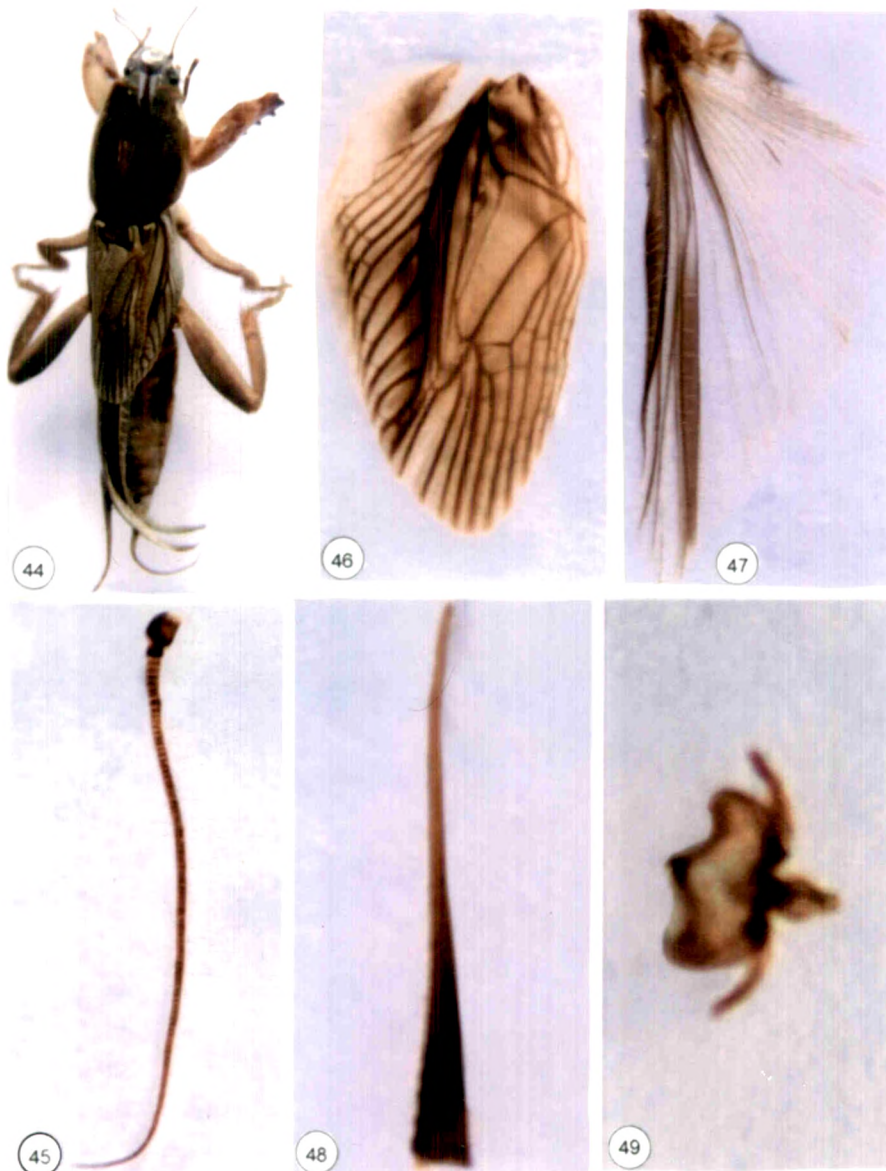


PLATE - 8: *Gryllotalpa micromi* sp.nov. Fig. 44: **Adult Male** Fig. 45: Antenna Fig.46: Tegmina Fig. 47: Hind wing Fig. 48: Anal cerci Fig. 49: Genitalia

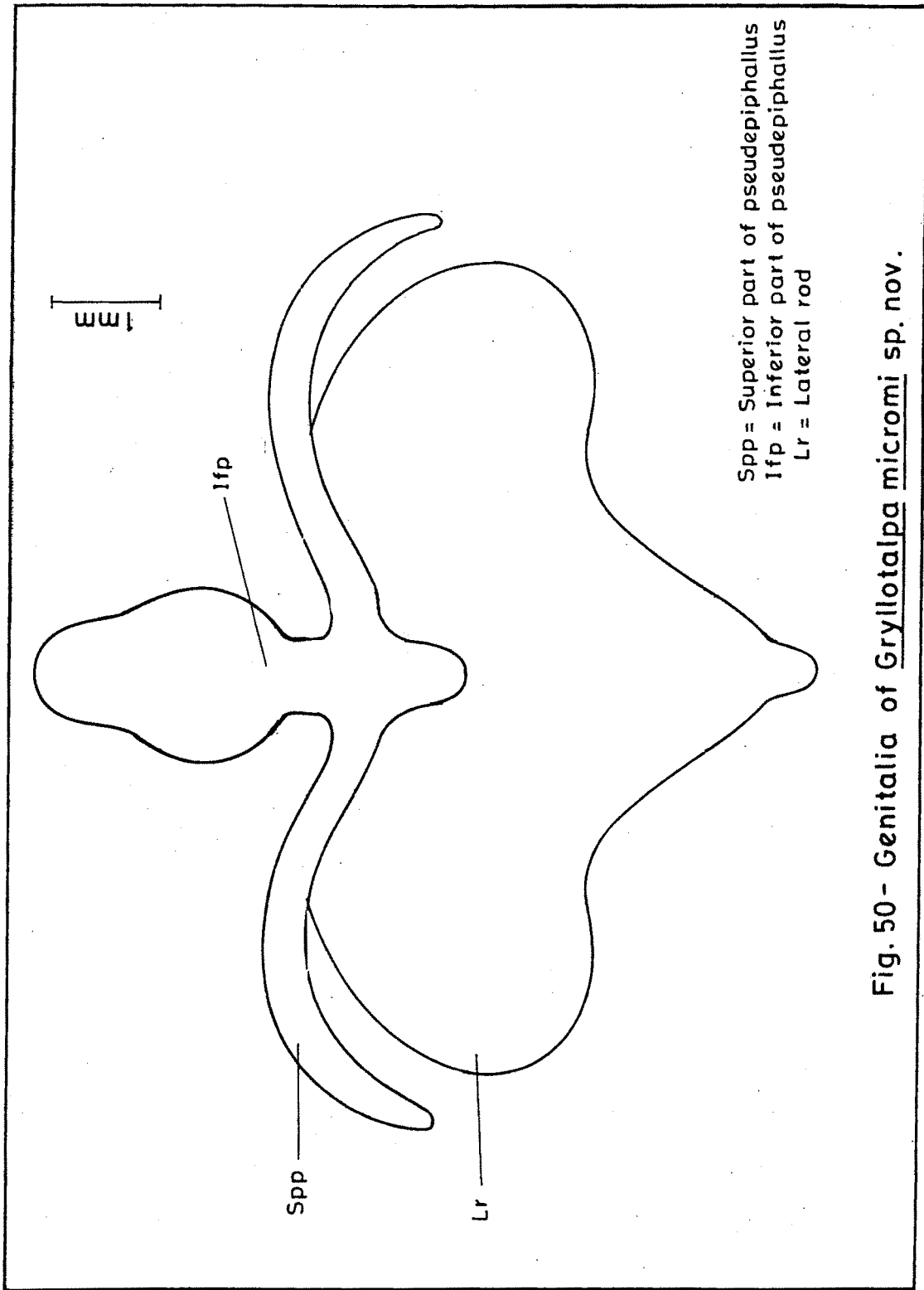


Fig. 50- Genitalia of Gryllotalpa micromi sp. nov.

However, it differs from above species by having following characters.

- 1) Pronotal plate regularly convex side.
- 2) Tegmina extened to the 4<sup>th</sup> abdominal tergite.
- 3) Small sized mirror present.
- 4) Dactyl structure of fore leg tibia.
- 5) Trochanter proportion length  $\times$  width.
- 6) Three dark reddish brown tibial spines.
- 7) Genitalia proportion length  $\times$  width.
- 8) Flagellar formula:  
 $1=L/W=0.77, 15=L/W=0.50, Ts=L/W=1.40, A=C.89.$
- 9) Subcosta bearing 9 branches.

## **FAMILY: GRYLLIDAE**

The family Gryllidae is characterized by following features.

- 1) Head big and globular.
- 2) Tarsi compressed.
- 3) Hind tibiae armed with spines but never serrulated between these spines.

The family Gryllidae is subdivided into two subfamilies viz, Gryllinae and Nemobiinae. The subfamily Gryllinae is characterized by spines immovable on hind tibia and without hairs. The subfamily Gryllinae contain 23 genera namely,

*Landreva*, *Ectolandrevus*, *Landrevus*, *Gryllus*,  
*Brachytrupes*, *Acheta*, *Liogryllus*, *Gymnogryllus*,  
*Scapsipedus*, *Velarifictorus*, *Loxoblemmus*,  
*Platyblemmus*, *Stephoblemmus*, *Parasciobia*,  
*Gryllodes*, *Gryllopsis*, *Turanogryllus*, *Cophogryllus*,  
*Modicogryllus*, *Lenigryllus*, *Plebeiogryllus*,  
*Platygryllus*, *Teleogryllus*.

## SUBFAMILY GRYLLINAE

### Diagnostic characters:

1. Blackish, brownish or tawny coloured crickets of variable size.
2. Individuals with globular head.
3. Minute and compressed second tarsal segment with strong, glabrous, immovable spines.
4. Serrulation in between spines on posterior tibiae absent.
5. Both pairs of wings generally moderately well to fully developed or reduced.

### KEY TO THE INDIAN GENERA OF SUBFAMILY GRYLLINAE (Vasanth, 1993)

1. Posterior tibiae presenting serrulation proximal to spines.....2
- Posterior tibiae without serrulation.....4
2. Anterior tibiae without tympanum.....
- .....**Chopardia Bhowmik**
- Anterior tibiae with at least one tympanum.....3

3. Anterior tibiae presenting a tympanum on each face.....***Doulandrevus Kirby***
  - Anterior tibiae presenting a tympanum on external face only.....***Landreva Walker***
4. Body glabrous or nearly so; ocelli arranged in a straight line; length of posterior femora at least equal to the an combined lengths of tibia and tarsus.....5
  - Body usually more pubescent; ocelli arranged in the form of a triangle; length of posterior femora never greater than combined lengths of tibia and tarsus.....7
5. Pronotum greatly widening in front, with anterior margin strongly concave; abdomen narrow at base; female tegmina very short.....
  - .....***Sphecogryllus Chopard***
  - Pronotum only gradually widening in front with anterior margin feebly concave; abdomen not narrow at base; female tegmina fully developed.....6
6. Large, robust insects; male pronotum widening more strongly in front, anterior metatarsi very short, anterior and middle tibiae not ciliated with long hairs; ovipositor very short in relation to body size.....***Brachytrupes Serville***

- Smaller and slender insects; male pronotum, if at all, very slightly widening in front; anterior metatarsi moderately long, anterior and middle tibiae ciliated with long hairs; ovipositor longer in relation to body size.....  
.....**Gymnogryllus Saussuer**
- 7. Supra- anal plate bears a prominent pair of posteriorly projecting, heavily sclerotised structure.....**Spinogryllus Vasanth**
- Supra-anal plate bears no such structures....8
- 8. Face of male flattened, or more or less concave; frontal rostrum with or without prolongation or process.....9
- Face of male convex; frontal rostrum never with prolongation or process.....15
- 9. Both sexes apterous.....  
.....**Scapsipedoides Chopard**
- Tegmina present in both sexes in various degrees of development.....10
- 10. Face of male flattened, or slightly concave....11
- Face of male strongly flattened; frontal rostrum prolonged, and may be provided with a process.....12
- 11. Frontal rostrum of male subangulate, prominent, with a small apical depression.....  
.....**Coiblemmus Chopard**

- Frontal rostrum of male convex, with no special angulation or apical depression.....  
.....**Velarifictorus** **Randell**
- 12. Frontal rostrum of male projecting, simply angular, with no process.....  
.....**Loxoblemmus** **Saussure**
- Frontal rostrum of male strongly projecting a corneous or membranaceous process.....13
- 13. Frontal rostrum of male with a wide, corneous process which is never membraceous.....  
.....**Stephoblemmus** **Saussure**
- Frontal rostrum of male with an entire or divided membranaceous process.....14
- 14. Membranaceous process of frontal rostrum deeply divided into two large lobes.....  
.....**Meristoblemmus** **Chopard**
- Membranaceous process of frontal rostrum entire.....**Parasciobia** **Chopard**
- 15. Width of frontal rostrum subequal to that of first antennal segment.....16
- Width of frontal rostrum always about double that of first antennal segment.....17
- 16. Head dorsally flattened; ovipositor long.....  
.....**Gryllodes** **Saussure**
- Head dorsally rounded; ovipositor rudimentary  
.....**Itaropsis** **Chopard**



17. Body convex, cylindrical; female with imperfectly developed tegmina, often reduced to lateral pads.....18
  - Body more depressed, apterous or, when tegmina present in female never reduced to lateral pads.....19
18. Subgenital plate with conical or rounded apex, epiphallus of male genitalia without styli.....**Gryllopsis Chopard**
  - Subgenital plate with apex concave or deeply notched; epiphallus bearing styli on posterolateral corners.....  
.....**Turanogryllus Tarbinskii**
19. Completely apterous; anterior tibiae without tympanum.....**Cophogryllus Saussure**
  - Tegmina well developed, at least in male sex; anterior tibiae with at least one tympanum.....20
20. Male tegmina with confused mirror and reduced apical field.....21
  - Male tegmina with distinct mirror and reduced apical field.....22
21. Spines on posterior tibiae feebly movable.....  
.....**Nemobiodes Chopard**
  - Spines on posterior tibiae immovable.....  
.....**Callogryllus Sjostedt**

- 22. Epiphallus deeply emarginated posteriorly forming H-shaped structure.....23
- Epiphallus not H-shaped; may be trilobed..24
- 23. Endoparameres with a broad transverse parameral muscle apodeme, but not with expanded parameral muscle insertion area .....***Tratarogryllus Tarbinskii***
- Endoparameres with an expanded parameral muscle insertion, but with transverse muscle apodeme.....***Modicogryllus Chopard***
- 24. Anterior projection of ectoparameres approximately equal.....25
- Internal anterior projection of ectoparameres much longer than external anterior one....26
- 25. Endoparameres with a transverse parameral muscle apodeme; apex of ectoparamere not digitiform.....
- .....***Melanogryllus Chopard***
- Endoparameres without a transverse parameral muscle apodeme; apex of ectoparamere not digitiform..***Gryllus Linnaeus***

## GENUS *GRYLLUS* LINNAEUS

The genus *Gryllus* was erected by Linnaeus in 1758 with the help of type species: *Gryllus (Acheta) campestris* Linnaeus. The genus is cosmopolitan in distribution. Chopard (1969) has placed the genera *Acheta* Fabricius and *Tartarogryllus* Tarbinskii under the genus *Gryllus* Linnaeus. All the three above mentioned genera are very different from one another, chiefly in their male genitalia. Chopard (1969) described 33 species under the genus *Gryllus* from India.

### KEY TO THE SPECIES OF *GRYLLUS*

1. Body and legs almost glabrous. Large species typically black with a yellow spot at base of each tegmina ....***bimaculatus* De Geer**
  - Mirror broadly triangular with middle veins reduced, tibia yellowish brown with black spots.....***indica* sp. nov.**
  - Body and legs more or less pubescent; colouration different.....2
2. Larger species (length of body 18-26 mm).....3
  - Smaller species (length of body 8-16 mm)....14

3. Black with four whitish spots on the tegmina  
.....***quadrimaculatus* Saussure**
  - Tegmina without whitish spots.....4
4. Testaceous; head with a wide transverse brown band; body somewhat depressed.....  
.....***domesticus* Linne**
  - General colour brownish or blackish; body more convex.....5
5. Head without any marking.....6
  - Head presenting a yellow spot or band along each eye.....7
6. Larger species (length of body 21-28 mm); pubescent.....***testaceus* Walker**
  - Smaller species (length of body 18-22 mm); almost glabrous, shining .....***oceanicus***  
**Le Guillou**
    - Subcosta bearing 12 branches, oblique veins 5 in number, tibiae armed with 9 spines on each superior margin.....***ovali* sp. nov.**
7. Tegmina shorter than the abdomen.....8
  - Tegmina extending to the apex of abdomen.....11
8. Very larger species with relatively short posterior femora.....***validus* Chopard**
  - Smaller species with longer posterior femora.....9

9. Tegmina almost black with a very conspicuous yellow humeral band (♀)...**flavovittatus**  
**Chopard**
  - Tegmina brown.....10
10. Mirror a little wider than long, almost rounded  
.....**himalayanus** **Chopard**
  - Mirror much wider than long, triangular.....**triangulifer** **Chopard**
11. Head and pronotum blackish, contrasting with the testaceous tegmina; mirror of the male almost apical, non-divided.....**carmichaeli**  
**Chopard**
  - Tegmina of the same colour as the anterior part of the body.....12
12. Posterior legs remarkably long; posterior femora relatively slender..**gracilipes** **Saussure**
  - No yellowish spot between the ocelli and eyes, mirror is pentagonal, subcosta bearing 8 branches.....**pentagoni** **sp. nov.**
  - Posterior legs shorter; posterior femora stouter.....13
13. Head presenting two very neat, narrow, yellow bands along the internal margin of the eyes; genitalia of male long, feebly trilobate at apex.....**mitratus** **Burmeister**

- Head with a very faint yellow band along the internal margin of the eyes; genitalia short trilobate.....**facialis Walker**
- 14. Body stout and somewhat depressed.....15
- Body more elongate and convex.....16
- 15. Ovipositor of normal length...**guttiventris Walker**
- Ovipositor very short (5.5-6 mm)....**brunneri Saussure**
- 16. Head black or brown, without any marking or with very short lines on the occiput.....17
- Head adorned with light bands on the occiput or between the ocelli.....24
- 17. Smaller species (length of body 10-11mm); blackish with fulvous legs.....18
- Legs of the same general colour as the body.  
.....19
- 18. Pronotum with parallel sides; lateral field of tegmina with widely separated veins.....  
.....**blennus Saussure**
- Pronotum slightly enlarged in front; lateral field of tegmina with regularly spaced veins.....**pallipes Chopard**
- 19. Posterior femora relatively long and slender.....20
- Posterior femora stouter.....22

20. Larger species (length of body 15-16 mm);  
posterior tibiae as long as the femora.....21
- Smaller species (length of body 11 mm);  
posterior tibiae shorter than the femora.....  
.....**fletcheri Chopard**
21. Legs light brown; mirror of male a little longer  
than broad; 4 oblique veins.....  
.....**longipennis Saussure**
- Legs rufous, all the femora blackish at apex;  
mirror of male as long as broad; 3 oblique  
veins.....**bicoloripes Chopard**
22. Colouration uniformly brown or black.....23
- Colouration brownish; head black with a  
yellow spot along the eyes..**angustulus Walker**
23. General colouration blackish; head black,  
shining.....**melanocephalus Serville**
- Uniformly chestnut-brown.....**castaneus  
Chopard**
24. Head with a transverse yellow band between  
the ocelli.....27
- Head without transverse light band.....25
25. Head yellowish with three broad brown bands  
uniting on the rostrum.....**signifrons Walker**
- Head adorned on the occiput with five light  
bands.....26

26. Very smaller species (length of body 8.5 mm);  
tegmina of male with 4 oblique vein.....  
.....***minimus* Chopard**
- Larger species (length of body 12 mm);  
ovipositor very short.....***brevecaudatus***  
**Chopard**
27. Colouration uniformly light fulvous brown;  
pattern of the head feebly marked...  
.....***flavus* Chopard**
- Colouration varied with brown or blackish...28
28. Blackish.....29
- Brown or testaceous varied with brown.....30
29. Head black with a narrow luteous  
band.....***signipes* Walker**
- Anterior femora with yellowish marking above;  
blackish streaks on the hind femora, tegmina  
is blackish and not covering the tip of  
abdomen..... ***lanceolati* sp. nov.**
- Head blackish with two transverse yellowish  
bands.....***rehni* Chopard**
30. Veins of the lateral field of tegmina regularly  
and feebly spaced.....31
- Veins of the lateral field of tegmina distant  
and strongly curved....***confirmatus* Walker**



- Tegminal mirror quadrangular, tibia with 8  
spines on each superior margin.....  
.....*irroriquadri* sp. nov.

***GRYLLUS OVALI* SP. NOV.**

**MALE (Fig. 51):**

15.00 mm long excluding anal appendages, body usually more pubescent, more depressed, dark brown to blackish, head 3.00 mm long, thorax 5.00 mm long, tegmina 9.00 mm long, hind wing 17.00 mm long; abdomen 7.00 mm long, anal cerci 7.00 mm long, dark brown, densely hairy.

**HEAD:**

3.00 mm long, 4.00 mm broad, oval; occiput dark brown to blackish; compound eyes faint brown, ocular distance 0.90 mm; interocular distance 3.00 mm; 3 ocelli arranged in triangle, yellowish brown, circular, ocellar distance 0.18 mm, interocellar distance 0.89 mm; antennae on frontal rostrum; width of frontal rostrum always about double that of first antennal segment; face hairy, face of male convex, frontal rostrum never with prolongation or process; clypeus black, triangular,

0.82 mm long, 1.23 mm broad; labrum dark brown  
1.18 mm long, 2.00 mm broad; maxillary palpi  
yellowish to dark brown, cylindrical, 3.00 mm long,  
0.25 mm broad, 5 segmented.

**Antenna (Fig. 52):**

22.00 mm long, 0.80 mm broad, reddish  
brown; scape 0.50 mm long, 0.53 mm broad;  
pedicel 0.18 mm long, 0.20 mm broad; flagellum  
165 segmented, 21.32 mm long, 0.14 mm broad; 1<sup>st</sup>  
segment 0.11 mm long, 0.14 mm broad; 15<sup>th</sup>  
segment 0.10 mm long, 0.15 mm broad; terminal  
segment 0.09 mm long, 0.05 mm broad.

**Flagellar formula:**

$1=L/W=0.79$ ,  $15=L/W=0.67$ ,  $Ts=L/W=1.80$ ,  $A=1.08$

**THORAX:**

5.00 mm long, 4.00 mm broad, yellowish  
to dark brown, densely hairy, pronotal plate flat.

**Tegmina (Fig. 53):**

Tegmina well developed, long, narrow, extended to 9<sup>th</sup> abdominal tergite, 9.00 mm long, 5.00 mm broad, yellowish brown, mirror oval, subcosta bearing 12 branches, oblique veins 5 in number.

**Hind wing (Fig. 54):**

17.00 mm long, 9.00 mm broad, yellowish brown, wings longer than tegmina.

**Legs:**

Fore leg, mid leg lighter than body colour, hind leg darker than body colour.

**Fore leg:**

9.95 mm long, 1.18 mm broad; coxa 1.30 mm long, 1.18 mm broad, dark brown, densely hairy at outer margin; trochanter 0.65 mm long, 0.54 mm broad, dark brown, sparsely hairy; femur 3.00 mm long, 1.00 mm broad, dark brown, densely hairy;

tibia 3.00 mm long, 0.49 mm broad, yellowish to dark brown, anterior tibiae with one tympanum, 3 dark brown tibial spines, densely hairy; tarsus 3 segmented, 2.00 mm long, 0.27 mm broad, dark brown, densely hairy, dark brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 1.32 mm long, 0.61 mm broad; 2<sup>nd</sup> tarsal segment 0.45 mm long, 0.30 mm broad; 3<sup>rd</sup> tarsal segment 0.55 mm long, 0.18 mm broad; claw dark brown.

**Mid leg:**

12.45 mm long, 1.09 mm broad; coxa 0.91 mm long, 1.07 mm broad, dark brown, densely hairy; trochanter 0.54 mm long, 0.67 mm broad, yellowish brown, densely hairy; femur 4.00 mm long, 1.00 mm broad, dark brown, densely hairy; tibia 4.00 mm long, 0.47 mm broad, dark brown, densely hairy, 3 dark brown tibial spines; tarsus 3 segmented, 3.00 mm long, 0.32 mm broad, dark brown, densely hairy, reddish brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 1.05 mm long, 0.19 mm broad; 2<sup>nd</sup> tarsal segment 0.40 mm long, 0.27 mm broad; 3<sup>rd</sup> tarsal segment 1.25 mm long, 0.32 mm broad; claw yellowish brown.

**Hind leg:**

21.35 mm long, 1.00 mm broad; coxa 2.00 mm long, 1.00 mm broad, yellowish brown, densely hairy at outer margin; trochanter 1.35 mm long, 1.38 mm broad, yellowish brown, sparsely hairy; femur 9.00 mm long, 3.00 mm broad, yellowish to dark brown, densely hairy, length of posterior femora never greater than combined length of tibia and tarsus; tibia 5.00 mm long, 0.66 mm broad, yellowish to dark brown, densely hairy, posterior tibiae without serrulation proximal to spines, 18 reddish brown tibial spines; tarsus 3 segmented, 4.00 mm long, 0.63 mm broad, dark brown, yellowish brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.30 mm broad; 2<sup>nd</sup> tarsal segment 0.39 mm long, 0.44 mm broad, minute and compressed; 3<sup>rd</sup> tarsal segment 1.27 mm long, 0.26 mm broad; claw dark brown.

**ABDOMEN:**

7.00 mm long, 3.00 mm broad, dark brown to blackish, tapering to posterior side, 10 segmented; anal cerci (fig. 55) 7.00 mm long, dark brown,

densely hairy; supra anal plate do not bear a prominent pair of posteriorly projecting heavily sclerotised structure.

**Genitalia (Fig. 56 and 57):**

Genitalia trilobed, yellowish brown; epiphallus not 'H' shaped but trilobed; anterior projections of ectoparameres approximately equal; endoparameres without a transverse paramental muscle apodem, apex of ectoparameres digitiform; superior part of pseudepiphallus 1.84 mm long, 0.77 mm broad; inferior part of pseudepiphallus 1.13 mm long, 0.13 mm broad; lateral rod 2.66 mm long, 0.17 mm broad.

**COLOUR:**

**Dark brown to blackish:** Occiput, abdomen.

**Black:** Clypeus.

**Faint brown:** Compound eyes.

**Yellowish brown:** Ocelli, tegmina, hind wing, mid leg trochanter, claw, hind leg coxa,

trochanter, tarsal denticles,  
genitalia.

**Reddish Brown:** Antennae, mid leg tarsal  
denticles, hind leg tibial spines.

**Yellowish to dark brown:** Maxillary palpi,  
thorax, fore leg tibia, hind leg femur,  
tibia.

**Dark brown:** Labrum, fore leg coxa, trochanter,  
femur, tibial spines, tarsus, claw,  
mid leg coxa, femur, tibia, tibial  
spines, tarsus hind leg tarsus, claw,  
anal cerci.

**HOLOTYPE:** Male, India, Maharashtra,  
Coll. 28-XI-2007; Awate Manisha;  
antenna, wings, cerci, genitalia,  
on slide labeled as above;  
other parts with pinned  
form, labeled as above.

**PARATYPE:** 4 ♂, 3 ♀, Coll. from 3-VI-2006 to  
30-XI-2007 same data as above.



**DISTRIBUTIONAL RECORD:** 3 ♂ Kagal, 29-V-2006;  
2♂ Chandgad, 5-XI-2006;  
1♀ Kolhapur, 5-XI-2006; 1♂  
Kolhapur, 31-XII-2006; 1♀  
Radhanagari, 3-VI-2007.

### ETYMOLOGY

The mirror on the tegmina in the species is oval hence the name *Gryllus ovali* sp. nov.

### REMARKS

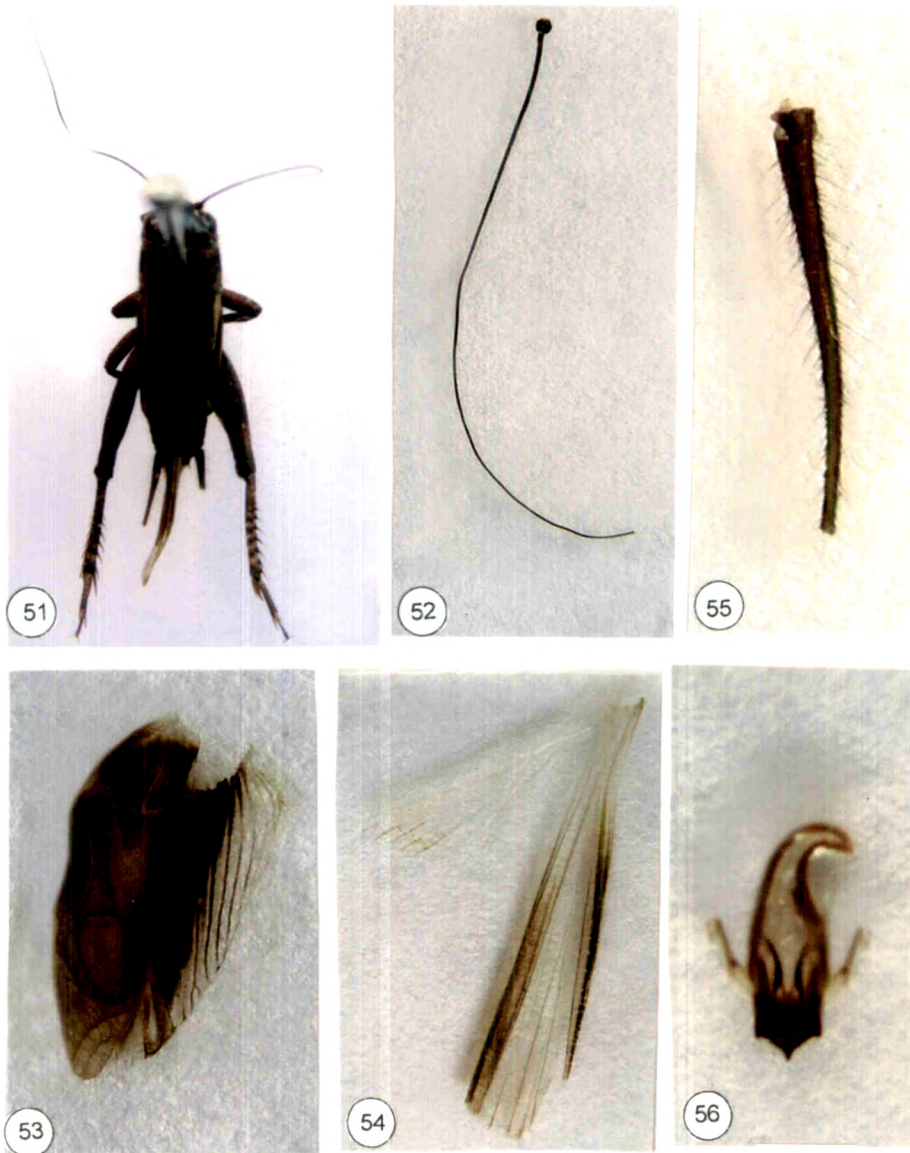
According to the key of Chopard (1969) and Vasanth (1993) *Gryllus ovali* sp. nov. runs close to *Gryllus oceanicus* Le- guillou by having following characters.

1. Colouration brownish to blackish.
2. Head and pronotum shining.
3. Mirror well developed.

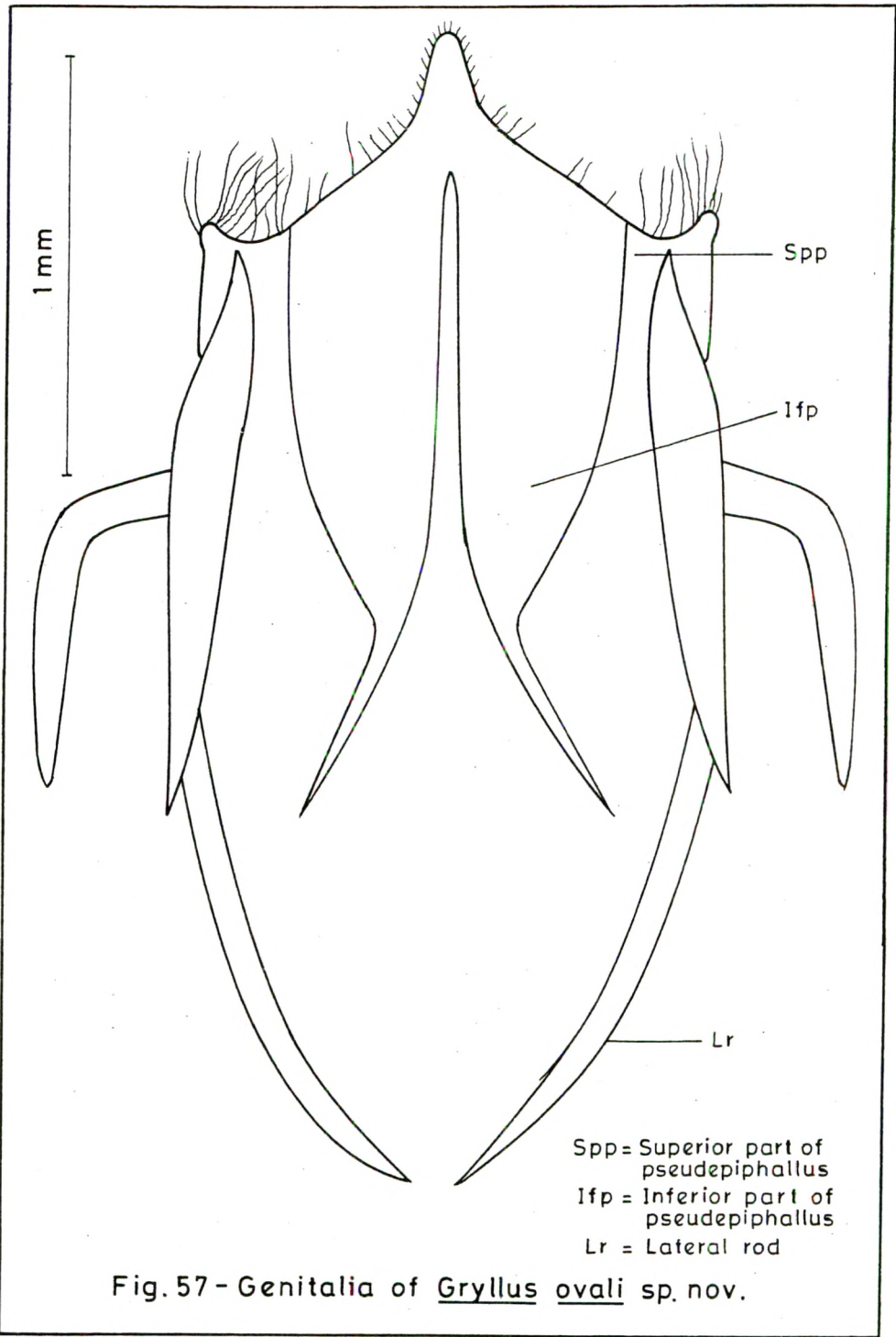
However, it differs from the above species by having following characters.

1. Tibiae armed with 9 spines on each superior margin instead of 6-7.
2. Subcosta bearing 12 branches instead of 5.
3. Mirror shape proportion.
4. Genitalia trilobed, epiphallus not 'H' shaped.
5. Oblique vein 5 instead of 3.
6. Flagellar formula:

$$1=L/W=0.79, 15=L/W=0.67, Ts=L/W=1.80, A=1.08$$



**PLATE -9: *Gryllus ovali* sp. nov. Fig. 51: 'Adult Male Fig. 52: Antenna Fig.53: Tegmina Fig. 54: Hind wing Fig. 55: Anal cerci Fig. 56: Genitalia**



***GRYLLUS MIRRORQUADRI* SP. NOV.****MALE (Fig. 58):**

Body pubescent, yellowish to brown, more depressed, more elongated and convex, 16.00 mm long excluding anal appendages, head 3.00 mm long, thorax 6.00 mm long, tegmina 9.00 mm long, hind wing 17.00 mm long; abdomen 7.00 mm long, dark brown to blackish; anal cerci 5.00 mm long, dark brown to blackish, densely hairy.

**HEAD:**

Head brown with narrow yellow band, 3.00 mm long, 4.00 mm broad, oval; occiput dark brown; compound eyes faint brown, encircled by yellow band, ocular distance 1.41 mm, interocular distance 2.00 mm; head with a transverse yellow band between the ocelli, 3 ocelli in triangle, yellowish brown, circular, ocellar distance 0.25 mm, interocellar distance 1.05 mm; antennae in frontal rostrum, face of the male convex, frontal rostrum never with prolongation, frontal rostrum always

about double that of first antennal segment; clypeus dark brown, triangular, 0.91 mm long, 0.93 mm broad; labrum yellowish brown 0.83 mm long, 1.29 mm broad; maxillary palpi dark brown, cylindrical, 3.00 mm long, 0.20 mm broad, 5 segmented.

**Antenna (Fig. 59):**

13.00 mm long, 0.55 mm broad, yellowish brown; scape 0.45 mm long, 0.55 mm broad; pedicel 0.20 mm long, 0.17 mm broad; flagellum 108 segmented, 12.35 mm long, 0.15 mm broad; 1<sup>st</sup> segment 0.08 mm long, 0.15 mm broad; 15<sup>th</sup> segment 0.09 mm long, 0.11 mm broad; terminal segment 0.07 mm long, 0.08 mm broad.

**Flagellar formula:**

$1=L/W=0.53, 15=L/W=0.81, Ts=L/W=0.87, A=0.73$

**THORAX:**

6.00 mm long, 4.00 mm broad, dark brown, densely hairy, pronotum with yellow broken convex band, lateral lobes rectangular.

**Tegmina (Fig. 60):**

Tegmina well developed, long, narrow, extended to 9<sup>th</sup> abdominal tergite, 9.00 mm long, 4.00 mm broad, yellowish brown; male tegmina with distinct mirror and apical field, mirror longer than wide, oblique veins 3 in number, apical field with 7 veins.

**Hind wing (Fig. 61):**

17.00 mm long, 5.00 mm broad, yellowish brown, wings longer than tegmina.

**Legs:**

Fore leg, mid leg, hind leg lighter than body colour.

**Fore leg:**

8.47 mm long, 1.04 mm broad, coxa 0.70 mm long, 1.04 mm broad, dark brown, densely hairy; trochanter 0.77 mm long, 0.72 mm broad, dark brown, sparsely hairy; femur 3.00 mm long, 1.00 mm broad, yellowish brown, densely hairy; tibia

2.00 mm long, 0.36 mm broad, dark brown, 3 dark brown tibial spines, densely hairy, anterior with one tympanum; tarsus 3 segmented, 2.00 mm long, 0.22 mm broad, dark brown, densely hairy, dark brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 0.79 mm long, 0.20 mm broad; 2<sup>nd</sup> tarsal segment 0.12 mm long, 0.20 mm broad; 3<sup>rd</sup> tarsal segment 0.83 mm long, 0.16 mm broad; claw yellowish to dark brown.

**Mid leg:**

9.19 mm long, 1.29 mm broad, coxa 1.12 mm long, 1.29 mm broad, dark brown, densely hairy; trochanter 0.91 mm long, 1.04 mm broad, dark brown, sparsely hairy; femur 3.00 mm long, 0.83 mm broad, yellowish to dark brown, densely hairy; tibia 2.00 mm long, 0.37 mm broad, yellowish brown, densely hairy, 3 dark brown tibial spines; tarsus 3 segmented, 2.16 mm long, 0.25 mm broad, dark brown, densely hairy; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.26 mm broad; 2<sup>nd</sup> tarsal segment 0.28 mm long, 0.20 mm broad; 3<sup>rd</sup> tarsal segment 0.79 mm long, 0.17 mm broad; claw dark brown.



**Hind leg:**

20.91 mm long, 2.00 mm broad, coxa 2.00 mm long, 2.00 mm broad, yellowish brown, densely hairy; trochanter 0.91 mm long, 0.83 mm broad, dark brown, sparsely hairy; length of posterior femora equal but never greater than combined length of tibia and tarsus, femur 8.00 mm long, 3.00 mm broad, dark brown, densely hairy; posterior tibiae without serrulation proximal to spines, tibia 5.00 mm long, 0.30 mm broad, dark brown, densely hairy, 16 yellowish to dark brown tibial spines; tarsus 3 segmented, 5.00 mm long, 0.32 mm broad, dark brown, densely hairy, reddish brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 3.00 mm long, 0.31 mm broad; 2<sup>nd</sup> tarsal segment 0.29 mm long, 0.20 mm broad; 3<sup>rd</sup> tarsal segment 1.29 mm long, 0.18 mm broad; claw dark brown.

**ABDOMEN:**

7.00 mm long, 4.00 mm broad, dark brown above and yellow beneath, tapering to posterior side, 10 segmented; anal cerci (fig. 62) 5.00 mm long, dark brown, densely hairy; supra anal plate do

not bear a prominent pair of posteriorly projecting heavily sclerotised structure.

**Genitalia (Fig. 63 and 64):**

Superior part of pseudepiphallus reddish brown, 1.3 mm long, 0.16 mm broad, long hairs present; lateral rod 1.41 mm long, 0.16 mm broad; inferior part of pseudepiphallus 0.73 mm long, 0.26 mm broad; genitalia with superior bridge deeply and widely notched, forming two acute, erect lateral lobes; inferior pieces presenting well developed erect tooth.

**COLOUR:**

**Dark brown:** Occiput, maxillary palpi, thorax, fore leg coxa, tibia, tarsus, mid leg coxa, trochanter, tibial spines, tarsus, hind leg trochanter, femur, tibia, tarsus, mid, hind leg claw.

**Faint brown:** Compound eyes.

**Dark black:** Clypeus.

**Dark brown to yellow:** Abdomen.

**Yellowish brown:** Labrum, ocelli, antennae,  
tegmina, hind wing, fore leg femur,  
mid leg tibia, hind leg coxa.

**Yellowish to dark brown:** Mid leg femur, hind leg  
tibial spines, fore leg claw,  
anal cerci.

**Reddish brown:** Genitalia

**HOLOTYPE:** Male, India, Maharashtra, Coll.  
29-X-2006; Awate Manisha;  
antenna, wings, cerci, genitalia,  
on slide labeled as above  
other parts with pinned  
form, labeled as above.

**PARATYPE:** 5 ♂, 5 ♀, Coll. from 3-VI-2006 to  
30-XI-2007 same data as above.

**DISTRIBUTIONAL RECORD:** 3 ♀ Panhala,  
23-VII-2006; 2 ♂ Kagal, 29-VI-  
2006; 3 ♂ Bhudargad, 15 -VI-  
2007; 2 ♀ Kolhapur, 28-VIII-2007.

## ETYMOLOGY

The mirror of the tegmina is quadrangular in the species hence the name *Gryllus mirroriquadri* sp. nov.

## REMARKS

According to the key of Chopard (1969) and Vasanth (1993), *Gryllus mirroriquadri* sp. nov. runs close to *Gryllus confirmatus* Walker by having following characters.

1. Head brown with narrow yellow band.
2. Abdomen dark brown above.
3. Legs yellow.

However, it differs from above species by having following characters

1. Pronotum with yellow broken convex band.
2. Eyes encircled by yellow band.
3. Antennal length proportion to the body.

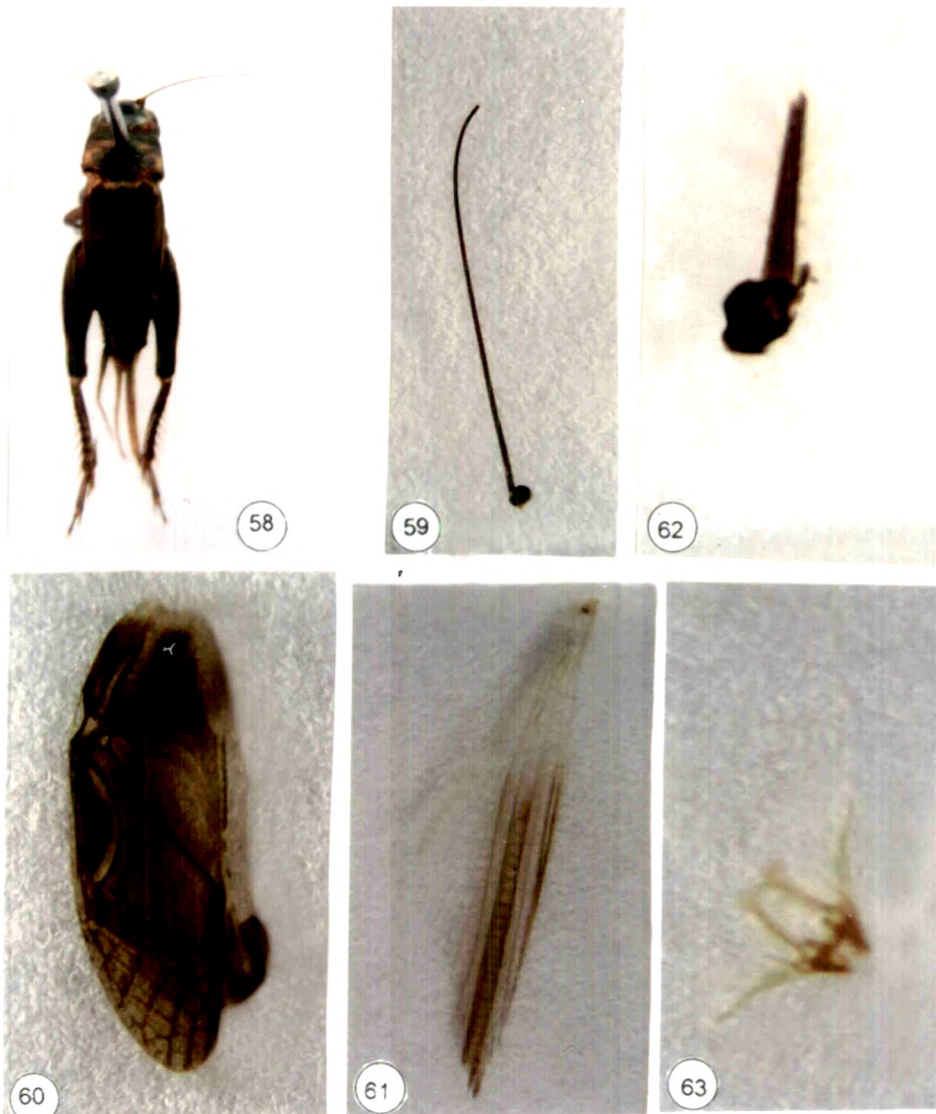
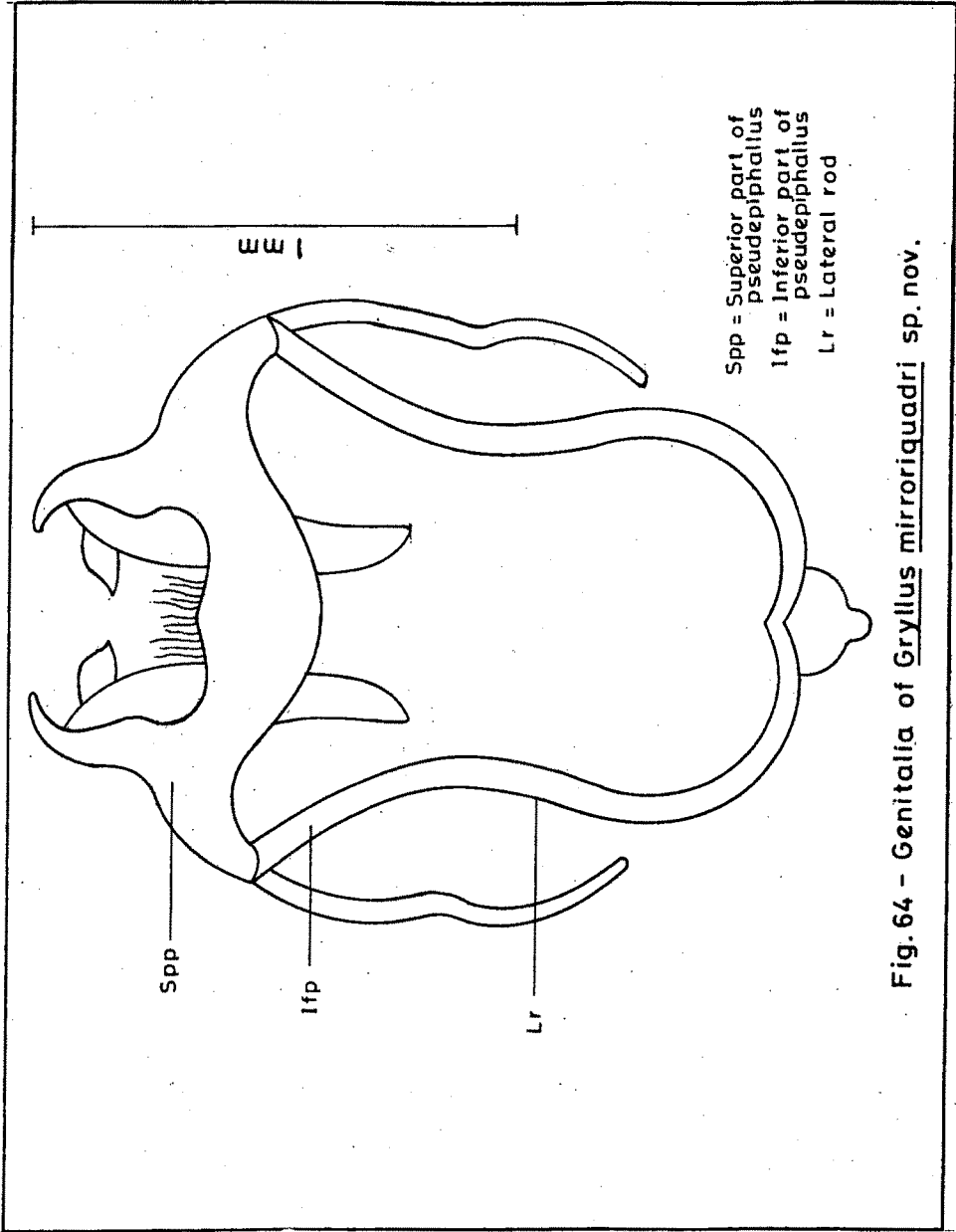


PLATE -10: *Gryllus mirroriquadri* sp. nov. Fig. 58: Adult Male Fig. 59: Antenna Fig.60: Tegmina Fig. 61: Hind wing Fig. 62: Anal cerci Fig. 63: Genitalia



4. Tibia with 8 spines on each superior margin instead of 5.
5. Tegminal mirror quadrangular.
6. Apical field with 7 veins instead of 5.
7. Flagellar formula:

$$1=L/W=0.53, 15=L/W=0.81, Ts=L/W=0.87, A=0.73$$

8. Genitalia having well developed erect tooth and superior part of pseudepiphallus having long hairs.

***GRYLLUS MIRRORQUADRI* SP. NOV.****FEMALE (Fig. 65):**

Body yellowish to dark dark brown, pubescent, elongate and convex, more depressed, 18.00 mm long excluding anal appendages, head 4.00 mm long, thorax 6.00 mm long, tegmina 11.00 mm long, hind wing 18.00 mm long; abdomen 8.00 mm long, blackish; anal cerci 6.00 mm long, dark brown, ovipositor 6.00 mm long, yellowish to reddish brown.

**HEAD:**

4.00 mm long, 5.00 mm broad, oval; occiput brown to blackish; compound eyes faint brown, ocular distance 1.08 mm, interocular distance 3.00 mm; head with yellow band between ocelli, 3 ocelli arranged in triangle, yellowish brown, circular, ocellar distance 0.20 mm, interocellar distance 0.98 mm; antennae on frontal rostrum, face of the female convex, frontal rostrum never with prologation,



frontal rostrum always about double that of first antennal segment, hairy; clypeus blackish, oval, 1.66 mm long, 1.34 mm broad; labrum dark brown, semicircular, 0.91 mm long, 2.00 mm broad; maxillary palpi dark brown, cylindrical, 4.00 mm long, 0.28 mm broad, 5 segmented.

**Antenna (Fig. 66):**

16.00 mm long, 0.19 mm broad, reddish brown; scape 0.35 mm long, 0.60 mm broad; pedicel 0.26 mm long, 0.17 mm broad; flagellum 163 segmented, 16.39 mm long, 0.20 mm broad; 1<sup>st</sup> segment 0.12 mm long, 0.20 mm broad; 15<sup>th</sup> segment 0.15 mm long, 0.10 mm broad; terminal segment 0.10 mm long, 0.05 mm broad, hairy.

**Flagellar formula:**

$1=L/W=0.6$ ,  $15=L/W=1.5$ ,  $Ts=L/W=2$ ,  $A=1.36$

**THORAX:**

6.00 mm long, 5.00 mm broad, yellowish to dark brown, densely hairy, pronotum tranverse with anterior margin feebly concave.

**Tegmina (Fig.67):**

Wings in female are always dissimilar with males of the same species, long, narrow, extended to last abdominal tergite, 11.00 mm long, 5.00 mm broad, yellowish brown, 5 branches of cubital, veins of lateral field of tegmina curved less than male tegmina.

**Hind wing (Fig. 68):**

18.00 mm long, 7.00 mm broad, yellowish brown, wings longer than tegmina.

**Legs:**

Fore leg, mid leg lighter than body colour; hind leg darker than body colour.

**Fore leg:**

12.15 mm long, 1.08 mm broad, coxa 1.20 mm long, 1.08 mm broad, dark brown, densely hairy at outer margin; trochanter 0.95 mm long, 0.86 mm broad, dark brown, sparsely hairy at outer margin; femur 4.00 mm long, 1.12 mm broad, dark brown, densely hairy; tibia 3.00 mm long, 0.53 mm broad, dark brown, 3 dark brown tibial spines, densely hairy; tarsus 3 segmented, 3.00 mm long, 0.31 mm broad, dark brown, densely hairy, denticles present in rows; 1<sup>st</sup> tarsal segment 1.37 mm long, 0.22 mm broad; 2<sup>nd</sup> tarsal segment 0.37 mm long, 0.24 mm broad; 3<sup>rd</sup> tarsal segment 0.79 mm long, 0.2 mm broad; claw reddish brown.

**Mid leg:**

10.99 mm long, 1.04 mm broad, coxa 1.16 mm long, 1.04 mm broad, dark brown, densely hairy; trochanter 0.83 mm long, 0.43 mm broad, yellowish brown, sparsely hairy; femur 3.00 mm long, 1.00 mm broad, yellowish brown, densely hairy; tibia 3.00 mm long, 0.42 mm broad, dark brown, densely hairy, dark brown 3 tibial spines; tarsus 3 segmented, 3.00 mm long, 0.18 mm broad,

dark brown, densely hairy, dark brown tarsal denticles present in rows; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.25 mm broad; 2<sup>nd</sup> tarsal segment 0.37 mm long, 0.29 mm broad; 3<sup>rd</sup> tarsal segment 1.33 mm long, 0.37 mm broad; claw reddish brown.

**Hind leg:**

25.00 mm long, 2.00 mm broad, coxa 2.00 mm long, 2.00 mm broad, yellowish brown, sparsely hairy; trochanter 2.00 mm long, 1.92 mm broad, grayish brown, sparsely hairy; length of posterior femora equal but never greater than combined length of tibia and tarsus, femur 10.00 mm long, 4.00 mm broad, yellowish brown to dark brown, densely hairy; posterior tibiae without serrulation proximal to spines, tibia 7.00 mm long, 0.69 mm broad, dark brown, 16 reddish brown tibial spines, densely hairy; tarsus 3 segmented, 4.00 mm long, 0.33 mm broad, dark brown, densely hairy, tarsal denticles present in rows; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.38 mm broad; 2<sup>nd</sup> tarsal segment 0.35 mm long, 0.39 mm broad; 3<sup>rd</sup> tarsal segment 1.37 mm long, 0.21 mm broad; claw reddish brown.

**ABDOMEN:**

8.00 mm long, 5.00 mm broad, yellowish brown to dark brown, tapering to posterior side, 9 segmented; anal cerci (fig.69) 6.00 mm long, dark brown; ovipositor (fig.70 and 71) shorter 6.00 mm long, 0.5 mm broad, acute apex, yellowish to reddish brown.

**COLOUR:**

**Brown to blackish:** Occiput, clypeus.

**Faint brown:** Compound eyes.

**Yellowish brown:** Ocelli, tegmina, hind wing, mid leg trochanter, hind leg coxa.

**Reddish brown:** Antennae, fore leg claw, mid leg tibial spines, claw, hind leg tibial spines, claw.

**Yellowish brown to dark brown:** Thorax, hind leg femur, abdomen.

**Dark brown:** Labrum, maxillary palpi, fore leg coxa, trochanter, femur, tibia, tibial spines, tarsus, mid leg coxa, femur, tibia, tarsus, hind leg tibia, tarsus, anal cerci.

**Grayish brown:** Hind leg trochanter.

**Yellowish to reddish brown:** Ovipositor.

**HOLOTYPE:** Female, India, Maharashtra, Coll. 28-X-2006; Awate Manisha; antenna, wings, cerci, ovipositor on slide labeled as above; other parts with pinned form, labeled as above.

**PARATYPE:** 6 ♂, 4 ♀, Coll. from 1-VI-2006 to 29 - XII - 2007 same data as above.

**DISTRIBUTIONAL RECORD:** 3 ♂ Ajara, 3-VI-2006; 2 ♂ Karveer, 29-VII-2007; 1 ♀ Gaganbavada, 24-IX-2006; 1 ♂ Kagal, 16-IX-2007; 2 ♀ Kagal, 16-IX-2007; 1 ♀ Kolhapur, 7-X-2007.

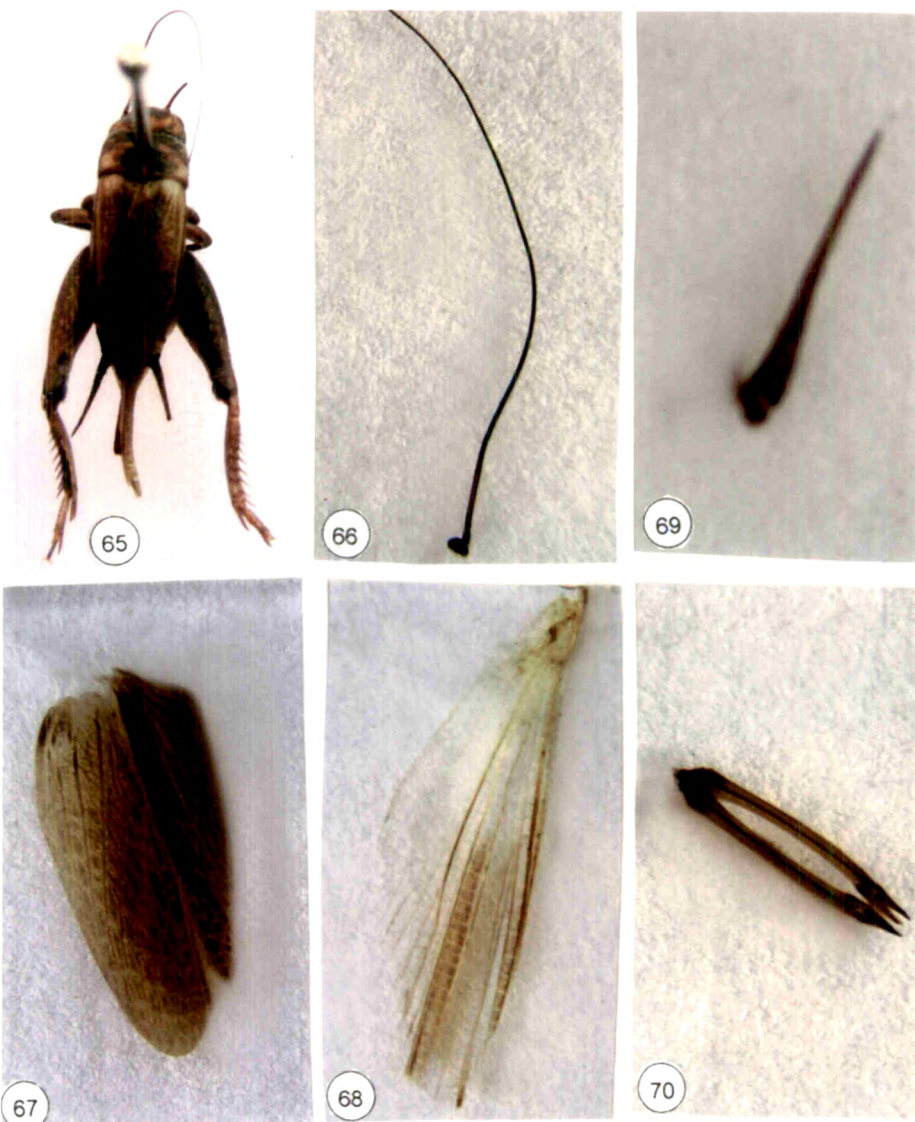


PLATE-11: *Gryllus mirroriquadri* sp. nov. Fig. 65: Adult Female Fig. 66: Antenna Fig. 67: Tegmina Fig. 68: Hind wing Fig. 69: Anal cerci Fig. 70: Ovipositor

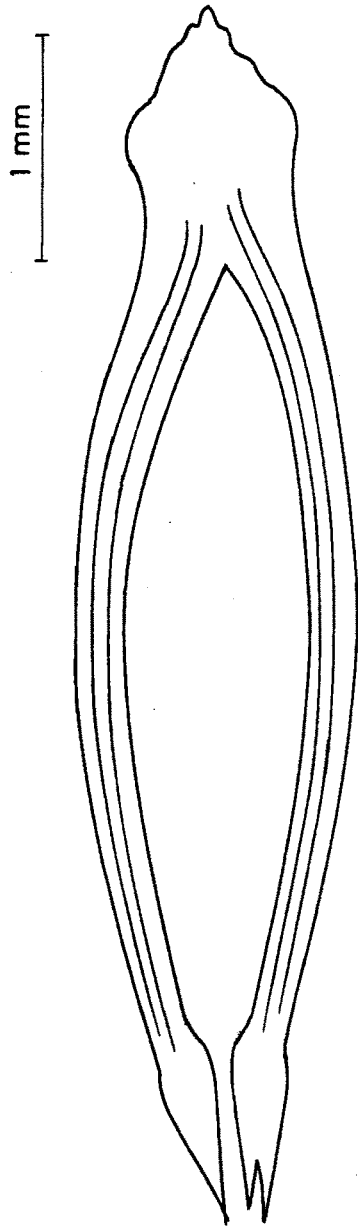


Fig.71- Ovipositor of Gryllus mirroriquadri  
sp. nov.



## ETYMOLOGY

As per given under description of male.

## REMARKS

According to the key of Chopard (1969) and Vasanth (1993) *Gryllus mirroriquadri* sp. nov. runs close to *Gryllus confirmatus* Walker by having following characters.

1. Head brown with yellow band.
2. Abdomen dark brown above.
3. Legs yellow.

However, it differs from above species by having following characters

1. Antennal length proportion to the body.
2. Five branches of cubital.
3. Tibia with 8 spines on each superior margin instead of 5.
4. Ovipositor short, acute apex.
5. Flagellar formula:

$$1=L/W=0.6, 15=L/W=1.5, Ts=L/W=2, A=1.36$$

***GRYLLUS INDICA* SP. NOV.****MALE (Fig.72):**

Body and legs glabrous black with yellow spot at base of each tegmina, body depressed, not so convex, pubescent, 17.00 mm long excluding anal appendages, head 3.00 mm long, thorax 7.00 mm long, tegmina 9.00 mm long, hind wing 16.00 mm long; abdomen 7.00 mm long; anal cerci 5.00 mm long, dark brown, densely hairy.

**HEAD:**

3.00 mm long, 4.00 mm broad, oval; occiput blackish; compound eyes dark black, ocular distance 1.56 mm, interocular distance 3.00 mm; 3 ocelli arranged in triangle, yellowish brown, circular, ocellar distance 0.34 mm, interocellar distance 0.78 mm; head with wide frontal rostrum, frontal rostrum never with prolongation, width of frontal rostrum always about double that of first antennal segment; antennae on frontal rostrum,

face of male convex; clypeus dark brown, quadrangular, 0.79 mm long, 2.00 mm broad; labrum yellowish to dark brown, semicircular, 0.55 mm long, 1.54 mm broad; maxillary palpi yellowish brown, cylindrical, 4.00 mm long, 0.24 mm broad, 5 segmented.

**Antenna (Fig.73):**

16.00 mm long, 0.46 mm broad, reddish brown; scape 0.48 mm long, 0.46 mm broad; pedicel 0.22 mm long, 0.15 mm broad; flagellum 163 segmented, 15.3 mm long, 0.15 mm broad; 1<sup>st</sup> segment 0.10 mm long, 0.15 mm broad; 15<sup>th</sup> segment 0.08 mm long, 0.12 mm broad; terminal segment 0.12 mm long, 0.05 mm broad.

**Flagellar formula:**

$1=L/W=0.66$ ,  $15=L/W=0.66$ ,  $Ts=L/W=2.40$ ,  $A=1.24$

**THORAX:**

7.00 mm long, 5.00 mm broad, yellowish brown to dark brown, densely hairy, pronotum strongly widening.

**Tegmina (Fig.74):**

Tegmina well developed, long, narrow, not extending to the apex of abdomen, 9.00 mm long, 6.00 mm broad, yellowish to dark brown, male tegmina with distinct mirror and apical field, mirror longer than wide, mirror broadly triangular with middle veins reduced, apical field well developed with reticulation, first chord veinlets absent; several oblique veins, subcosta bearing 11 branches.

**Hind wing (Fig.75):**

16.00 mm long, 7.00 mm broad, yellowish brown, wings longer than tegmina.

**Legs:**

Fore leg, mid leg, hind leg lighter than body colour.

**Fore leg:**

9.14 mm long, 1.09 mm broad, coxa 1.73 mm long, 1.09 mm broad, yellowish to dark brown, densely hairy; trochanter 0.41 mm long, 0.69 mm broad, dark brown, sparsely hairy; femur 3.00 mm long, 0.80 mm broad, yellowish to dark brown, densely hairy ; tibia 2.00 mm long, 0.43 mm broad, yellowish to dark brown, densely hairy, 2 yellowish brown tibial spines; tarsus 3 segmented, 2.00 mm long, 0.24 mm broad, dark brown, densely hairy, dark brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 1.08 mm long, 0.37 mm broad; 2<sup>nd</sup> tarsal segment 0.6 mm long, 0.25 mm broad; 3<sup>rd</sup> tarsal segment 0.25 mm long, 0.19 mm broad; claw dark brown.

**Mid leg:**

10.24 mm long, 0.86 mm broad, coxa 0.76 mm long, 0.86 mm broad, yellowish to dark brown, sparsely hairy at outer margin; trochanter 0.48 mm long, 0.66 mm broad, dark brown, sparsely hairy; femur 3.00 mm long, 0.83 mm broad, dark brown, densely hairy; tibia 3.00 mm long, 0.41 mm broad, dark brown, densely hairy, 3 dark brown tibial spines; tarsus 3 segmented, 3.00 mm long, 0.27 mm broad, dark brown, densely hairy, dark brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 1.16 mm long, 0.28 mm broad; 2<sup>nd</sup> tarsal segment 0.20 mm long, 0.19 mm broad; 3<sup>rd</sup> tarsal segment 1.04 mm long, 0.15 mm broad; claw dark brown.

**Hind leg:**

23.04 mm long, 2.00 mm broad, coxa 2.04 mm long, 2.00 mm broad, dark brown, densely hairy; trochanter 2.00 mm long, 1.00 mm broad, yellowish brown, sparsely hairy; posterior femora no longer than tibia and metatarsus together, femur 8.00 mm long, 3.00 mm broad, yellowish to dark brown, densely hairy; posterior tibiae without serrulation, tibia 6.00 mm long, 0.55 mm broad, dark brown,

densely hairy, 18 yellowish to dark brown tibial spines; tarsus 3 segmented, 5.00 mm long, 0.33 mm broad, dark brown, densely hairy, dark brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 3.00 mm long, 0.33 mm broad; 2<sup>nd</sup> tarsal segment 0.66 mm long, 0.20 mm broad; 3<sup>rd</sup> tarsal segment 1.16 mm long, 0.16 mm broad; claw dark brown.

#### **ABDOMEN:**

7.00 mm long, 3.00 mm broad, yellowish to dark brown, tapering to posterior side, 10 segmented; anal cerci (fig. 76) 5.00 mm long, dark brown, densely hairy; supra anal plate do not bear a prominent pair of posteriorly projecting heavily sclerotised structure.

#### **Genitalia (Fig. 77 and 78):**

Genitalia plain, formed of a large pieces divided into 3 acute apex, 2 lobes having long hairs; epiphallus not 'H' shaped, trilobed; anterior projection of ectoparameres approximately equal; endoparameres without a transverse parameral muscle; apodeme apex of ectoparamere digitiform; superior part of pseudepiphallus 0.75 mm long, 0.1

mm broad; lateral rod 1.3 mm long, 0.08 mm broad; inferior part of pseudepiphallus 0.71 mm long, 0.28 mm broad, yellowish brown.

**COLOUR:**

**Blackish:** Occiput.

**Dark black:** Compound eyes.

**Yellowish brown:** Maxillary palpi, ocelli, hind wing, fore leg tibial spines, hind leg trochanter.

**Reddish Brown:** Antennae.

**Yellowish brown to dark brown:** Labrum, thorax, tegmina, fore leg coxa, femur, tibia, mid leg coxa, hind leg femur, abdomen.

**Dark brown:** Clypeus, fore leg trochanter, tarsus, tarsal denticles, claws, mid leg trochanter, femur, tibia, tibial spines, tarsus, tarsal denticles, claw, anal cerci.



**HOLOTYPE:** Male, India, Maharashtra, Coll. 11-X-2006; Awate Manisha; antenna, wings, genitalia on slide labeled as above; other parts with pinned form, labeled as above.

**PARATYPE:** 5 ♂, 3 ♀, Coll. from 2-VII-2006 to 30-XI-2007 same data as above.

**DISTRIBUTIONAL RECORD:** 1♂ Hatkangale, 16-VII-2006; 1♂ Kolhapur, 26-VIII-2007; 1♂ Bhudargad 15-VI-2007; 1♂ Karveer, 2-IX-2007; 1♂ Ajara, 30-IX-2007; 2♀ Ajara 30-IX-2007; 1♀ Kagal, 6-X-2007.

### ETYMOLOGY

*Gryllus indica* sp. nov. has been reported from India for the first time, hence the name.

### REMARKS

According to the key of Chopard (1969) and Vasanth (1993) *Gryllus indica* sp. nov.

runs close to *Gryllus bimaculatus* De Geer by having following characters.

1. Body glabrous black colour.
2. Yellow spot at base of tegmina.

However, it differs from the above species by having following characters.

1. Tegmina not extending to the apex of abdomen.
2. Posterior tibiae armed with 9 spines on each superior margin.
3. Mirror broadly triangular with middle veins reduced.
4. Apical field well developed with reticulation.
5. Subcosta bearing 11 branches.
6. Oblique veins 4 in number.
7. Flagellar formula

$$1=L/W=0.66, 15=L/W=0.66, Ts=L/W=2.40, A=1.24$$

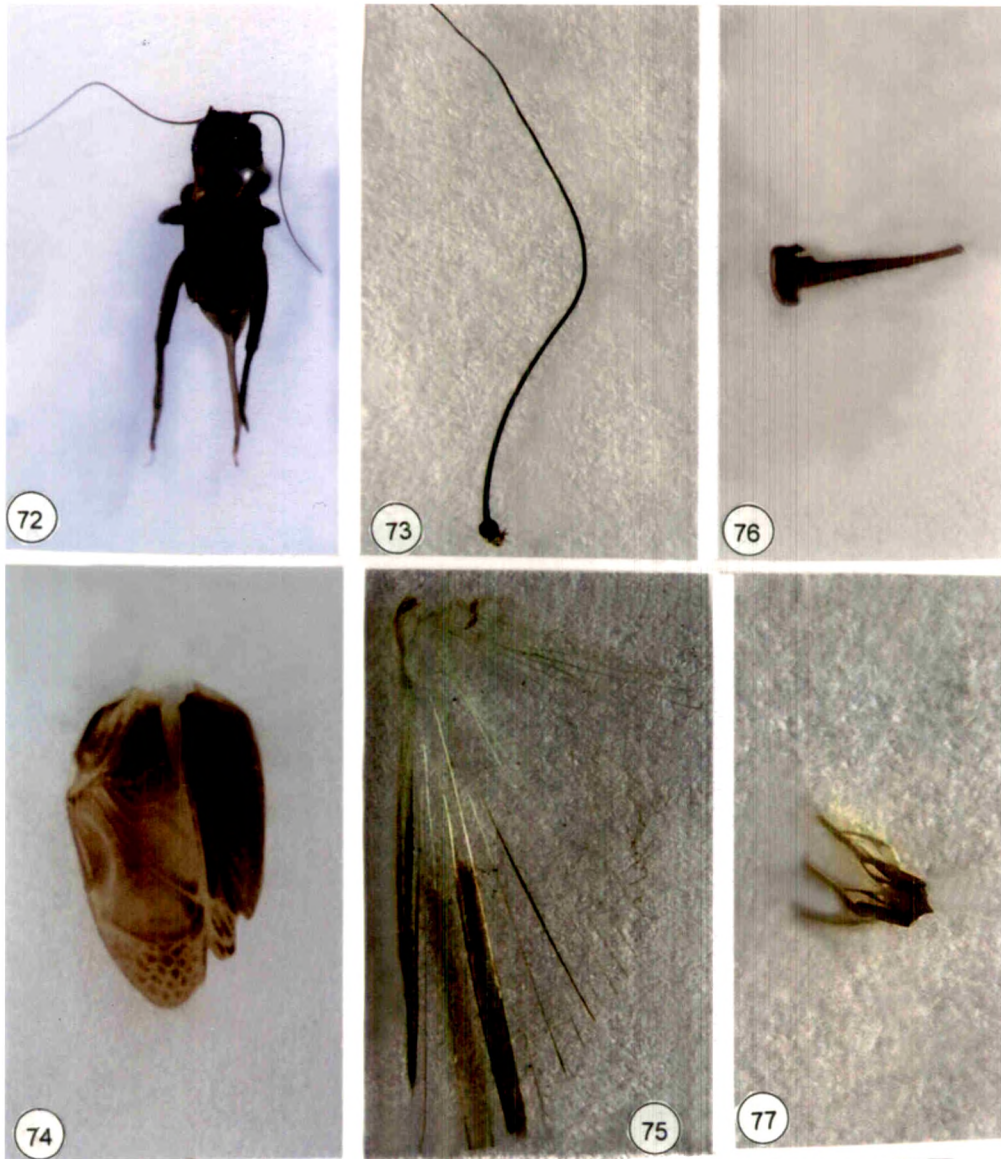
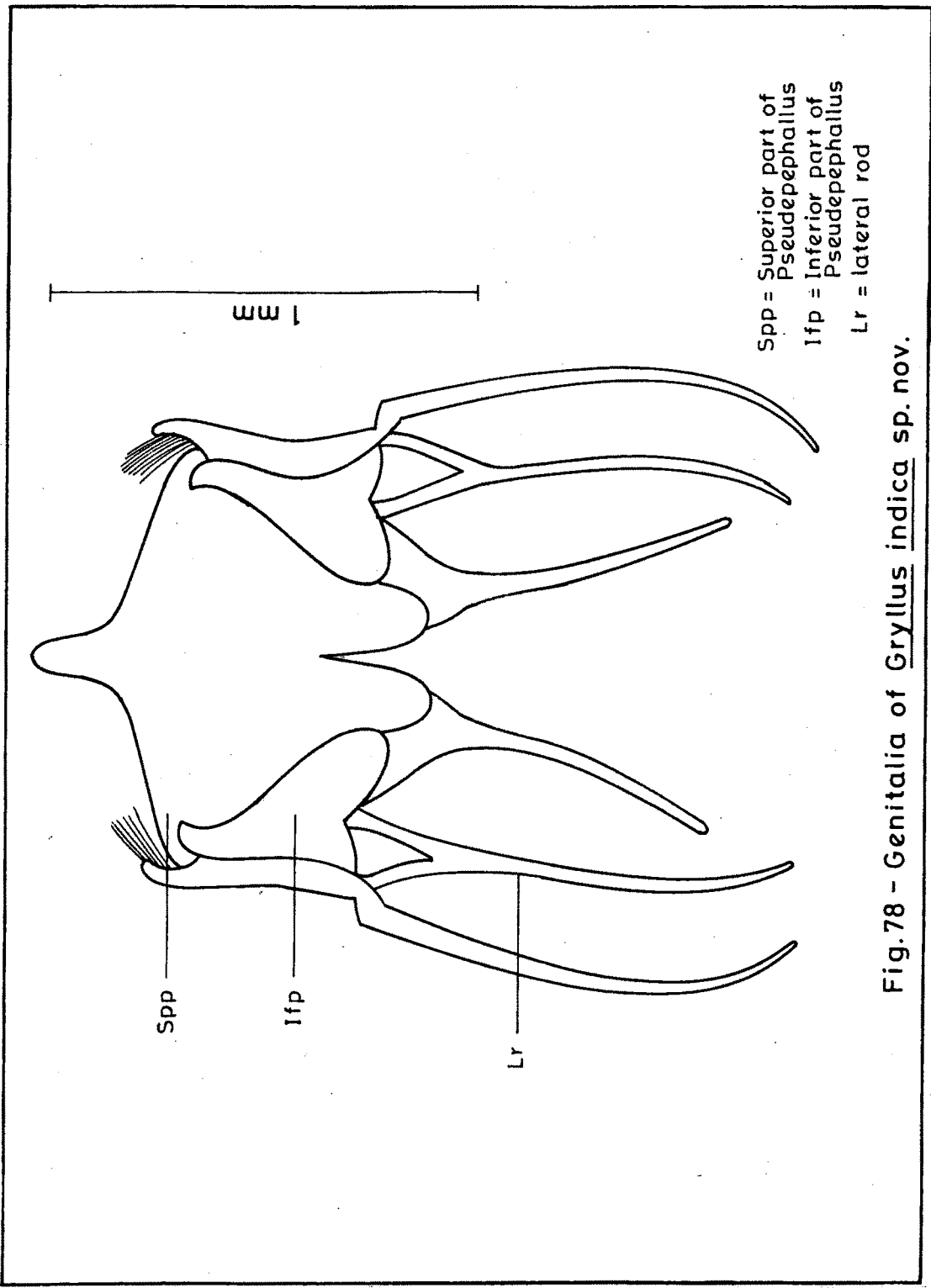


PLATE-12: *Gryllus indica* sp.nov. Fig.72: Adult Male Fig. 73: Antenna Fig.74: Tegmina Fig. 75: Hind wing Fig. 76: Anal cerci Fig. 77: Genitalia



Spp = Superior part of  
Pseudepephallus  
Ifp = Inferior part of  
Pseudepephallus  
Lr = lateral rod

Fig.78 - Genitalia of Gryllus indica sp. nov.

***GRYLLUS INDICA* SP. NOV.****FEMALE (Fig. 79):**

Body and legs glabrous black yellow spot at base, less convex, pubescent, 16.00 mm long excluding anal appendages, head 3.00 mm long, thorax 6.00 mm long, tegmina 10.00 mm long, hind wing 18.00 mm long; abdomen 7.00 mm long, dark brown; anal cerci 6.00 mm long, dark brown; ovipositor 7.00 mm long, reddish brown.

**HEAD:**

3.00 mm long, 4.00 mm broad, rounded; occiput dark brown to blackish; compound eyes black; ocular distance 1.04 mm, interocular distance 3.00 mm; 3 ocelli disposed in triangle, reddish brown, circular, ocellar distance 0.34 mm, interocellar distance 1.04 mm; head with wide frontal rostrum, frontal rostrum never with prolongation, width of frontal rostrum always about double that of first antennal segment; antennae on

frontal rostrum, face convex; clypeus, dark brown, semicircular, 0.37 mm long, 1.20 mm broad; labrum, yellowish brown, semicircular, 0.85 mm long, 1.41 mm broad; maxillary palpi, yellowish brown, cylindrical, 4.03 mm long, 0.30 mm broad, 5 segmented.

**Antenná (Fig. 80):**

20.00 mm long, 0.45 mm broad, yellowish to dark brown, antennal margin dark brown; scape 0.49 mm long, 0.59 mm broad, hairy; pedicel 0.22 mm long, 0.19 mm broad; flagellum 142 segmented, 19.29 mm long, 0.18 mm broad; 1<sup>st</sup> segment 0.11 mm long, 0.18 mm broad; 15<sup>th</sup> segment 0.09 mm long, 0.13 mm broad; terminal segment 0.12 mm long, 0.05 mm broad.

**Flagellar formula:**

$1=L/W=0.61$ ,  $15=L/W=0.69$ ,  $Ts=L/W=2.30$ ,  $A=1.20$

**THORAX:**

6.00 mm long, 5.00 mm broad, dark brown, sparsely hairy, pronotum superior, flat.

**Tegmina (Fig. 81):**

Tegmina well developed never reduced to small lateral pads, long, narrow, extended to last abdominal tergite, 10.00 mm long, 5.00 mm broad, dark brown, sparsely hairy.

**Hind wing (Fig. 82):**

18.00 mm long, 3.00 mm broad, yellowish brown, wings longer than tegmina.

**Legs:**

Legs colour similar to body colour.

**Fore leg:**

11.38 mm long, 2.00 mm broad, coxa 1.00 mm long, 2.00 mm broad, dark brown, densely hairy; trochanter 0.95 mm long, 0.93 mm broad, dark brown, densely hairy; femur 4.00 mm long, 1.07 mm broad, dark brown to blackish, densely hairy; tibia 2.43 mm long, 0.55 mm broad, dark brown, two dark brown tibial spines at the tip; tarsus 3

segmented, 3.00 mm long, 0.26 mm broad, dark brown; 1<sup>st</sup> tarsal segment 0.75 mm long, 0.26 mm broad; 2<sup>nd</sup> tarsal segment 0.25 mm long, 0.26 mm broad; 3<sup>rd</sup> tarsal segment 1.16 mm long, 0.20 mm broad; claw dark brown.

**Mid leg:**

12.26 mm long, 0.60 mm broad, coxa 2.00 mm long, 0.60 mm broad, dark brown to blackish, hairy; trochanter 0.86 mm long, 0.80 mm broad, dark brown, densely hairy; femur 4.00 mm long, 0.90 mm broad, dark brown to blackish, densely hairy; tibia 3.00 mm long, 0.48 mm broad, dark brown to blackish, densely hairy, 3 tibial spines; tarsus 3 segmented, 2.4 mm long, 0.22 mm broad, dark brown to blackish, sparsely hairy; 1<sup>st</sup> tarsal segment 1.29 mm long, 0.28 mm broad; 2<sup>nd</sup> tarsal segment 0.25 mm long, 0.33 mm broad; 3<sup>rd</sup> tarsal segment 1.33 mm long, 0.25 mm broad; claw reddish brown.

**Hind leg:**

22.86 mm long, 3.00 mm broad, coxa 2.00 mm long, 3.00 mm broad, brown to blackish;



trochanter 0.86 mm long, 1.56 mm broad, dark brown to blackish, hairy; posterior femora no longer than tibia and metatarsus together, femur 9.00 mm long, 3.00 mm broad, yellowish brown to dark brown, densely hairy; posterior tibia strong brownish black, none serrulated at base, tibia 6.00 mm long, 1.00 mm broad, tibia yellowish brown with black spots, 16 reddish brown tibial spines, densely hairy; tarsus 3 segmented, 5.00 mm long, 0.40 mm broad, dark brown, sparsely hairy, 8 reddish brown tarsal spine; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.42 mm broad; 2<sup>nd</sup> tarsal segment 1.25 mm long, 0.25 mm broad; 3<sup>rd</sup> tarsal segment 1.75 mm long, 0.39 mm broad; claw reddish brown.

#### **ABDOMEN:**

7.00 mm long, 4.00 mm broad, tapering to posterior side, yellowish brown to dark brown banded tergite, 10 segmented; anal cerci (fig.83) 6.00 mm long, dark brown, hairy; ovipositor (fig.84 and 85) 7.00 mm long, reddish brown, ovipositor shorter than posterior femora with apical valve lanceolate.

**COLOUR:**

**Dark brown to blackish:** Occiput, fore leg femur, tibia, tarsus, claw mid leg coxa, femur, tibia, tarsus, hind leg coxa, trochanter.

**Black:** Compound eyes.

**Reddish brown:** Ocelli, hind leg tibial, tarsal spines, tarsus, claw, ovipositor.

**Yellowish to dark brown:** Antennae, hind leg femur, abdomen.

**Dark brown:** Clypeus, thorax, tegmina, fore leg coxa, trochanter, mid leg trochanter, hind leg tarsus, anal cerci.

**Yellowish brown:** Labrum, maxillary palpi, hind wing, hind leg tibia.

**HOLOTYPE:** Female, India, Maharashtra, Coll. 16-IX-2007; Awate Manisha; antenna, wings, cerci, ovipositor on slide labeled as above; other

parts with pinned form, labelled  
as above.

**PARATYPE:** 4 ♂, 2 ♀, Coll. From 2-VII-2006 to  
2-XII-2007 same data as above.

**DISTRIBUTIONAL RECORD:** 1♂ Shahuwadi,  
6-VII-2006 1♂ Gaganbawada,  
15-III-2006; 1♂Gadhinglaj,  
4-XI-2006; 1♂ Shirol, 17-VI-2007;  
♀ Radhanagri, 3-VI- 2007;  
1♀ Kolhapur, 15-VIII-2007.

### ETYMOLOGY

As per given under description of male.

### REMARKS

According to the key of Chopard (1969) and  
Vasanth (1993) *Gryllus indica* sp. nov.  
runs close to *Gryllus bimaculatus* De Geer by having  
following characters.

1. Body glabrous black colour.
2. Yellow spot at base of tegmina.

3. Wings much longer than tegmina.

However, it differs from the above species by having following characters.

1. Ovipositor shorter than posterior femora.
2. Body length considerably smaller than *G. bimaculatus*.
3. Proportion of body length and antenna.
4. Tibia yellowish brown with black spots.
5. Flagellar formula:

$$1=L/W=0.61, 15=L/W=0.69, Ts=L/W=2.30, A=1.20$$

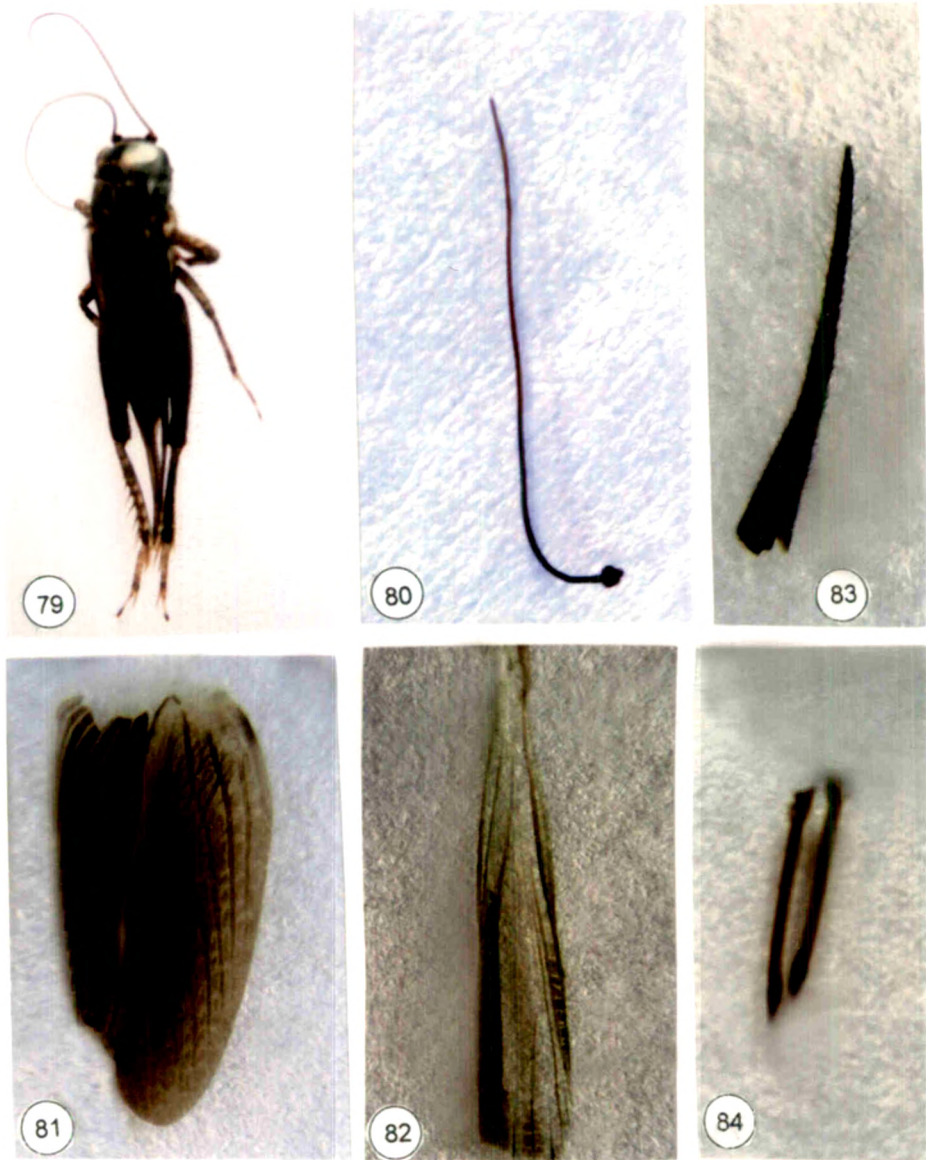


PLATE-13: *Gryllus indica* sp.nov. Fig.79: Adult Female Fig. 80: Antenna Fig.81: Tegmina Fig. 82: Hind wing Fig. 83: Anal cerci Fig. 84: Ovipositor

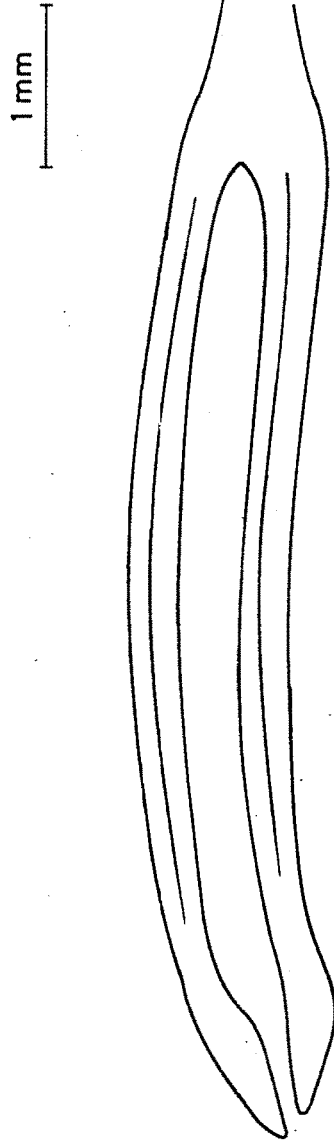


Fig.85 - Ovipositor of Gryllus indica sp. nov.

***GRYLLUS PENTAGONI SP. NOV.*****MALE (Fig. 86):**

Body elongated, yellowish to dark brown, very convex, 18.00 mm long excluding anal appendages, head 4.00 mm long, thorax 6.00 mm long, tegmina 11.00 mm long, hind wing 18.00 mm long; abdomen 8.00 mm long; anal cerci 6.00 mm long, dark brown, densely hairy.

**HEAD:**

4.00 mm long, 5.00 mm broad, oval; occiput dark brown to blackish; compound eyes faint brown, ocular distance 0.95 mm, interocular distance 3.00 mm; 3 ocelli in triangle, yellowish brown, circular, no yellowish spot between the ocelli and eyes, ocellar distance 0.20 mm, interocellar distance 0.97 mm; head with wide frontal rostrum, frontal rostrum never with prolongation, width of frontal rostrum always about double that of first antennal segment, antennae on frontal rostrum,

face hairy; clypeus black, triangular, 0.84 mm long, 1.27 mm broad; labrum dark brown 1.20 mm long, 2.00 mm broad; maxillary palpi yellowish to dark brown, cylindrical, 4.00 mm long, 0.28 mm broad, 5 segmented.

**Antenna (Fig. 87):**

19.00 mm long, 0.76 mm broad, reddish brown; scape 0.47 mm long, 0.52 mm broad; pedicel 0.19 mm long, 0.20 mm broad; flagellum 152 segmented, 18.34 mm long, 0.13 mm broad; 1<sup>st</sup> segment 0.12 mm long, 0.13 mm broad; 15<sup>th</sup> segment 0.09 mm long, 0.14 mm broad; terminal segment 0.09 mm long, 0.05 mm broad.

**Flagellar formula:**

$1=L/W=0.92$ ,  $15=L/W=0.64$ ,  $Ts=L/W=1.8$ ,  $A=1.12$

**THORAX:**

6.00 mm long, 5.00 mm broad, yellowish to dark brown, densely hairy, pronotum convex.



**Tegmina (Fig. 88):**

Tegmina without whitish spot, long, narrow, extended to the apex of the abdomen, 11.00 mm long, 6.00 mm broad, yellowish brown, tegmina of male with well developed mirror, short, wide, mirror little longer than broad, nearly pentagonal and not rounded, apical field large presenting 6 veins, subcosta bearing 8 branches.

**Hind wing (Fig. 89):**

18.00 mm long, 7.00 mm broad, yellowish brown, wings long, longer than tegmina.

**Legs:**

Fore leg, mid leg lighter than body colour, hind leg darker than body colour.

**Fore leg:**

11.01 mm long, 1.20 mm broad, coxa 1.32 mm long, 1.20 mm broad, dark brown, densely hairy at outer margin; trochanter 0.69 mm long, 0.52 mm broad, dark brown, sparsely hairy; femur 3.00 mm

long, 1.00 mm broad, dark brown, densely hairy; tibia 3.00 mm long, 0.46 mm broad, yellowish to dark brown, 3 dark brown tibial spines, densely hairy; tarsus 3 segmented, 3.00 mm long, 0.29 mm broad, dark brown, densely hairy, dark brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 1.35 mm long, 0.60 mm broad; 2<sup>nd</sup> tarsal segment 0.45 mm long, 0.29 mm broad; 3<sup>rd</sup> tarsal segment 0.76 mm long, 0.21 mm broad; claw dark brown.

**Mid leg:**

12.38 mm long, 1.09 mm broad, coxa 0.86 mm long, 1.09 mm broad, dark brown, densely hairy; trochanter 0.52 mm long, 0.66 mm broad, yellowish brown, densely hairy; femur 4.00 mm long, 1.00 mm broad, dark brown, densely hairy; tibia 4.00 mm long, 0.45 mm broad, dark brown, densely hairy, 3 dark brown tibial spines; tarsus 3 segmented, 3.00 mm long, 0.34 mm broad, dark brown, densely hairy, reddish brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 1.04 mm long, 0.20 mm broad; 2<sup>nd</sup> tarsal segment 0.39 mm long, 0.28 mm broad; 3<sup>rd</sup> tarsal segment 1.20 mm long, 0.34 mm broad; claw yellowish brown.

**Hind leg:**

Posterior leg remarkably long, 22.39 mm long, 1.00 mm broad, coxa 2.00 mm long, 1.00 mm broad, yellowish brown, densely hairy at outer margin; trochanter 1.39 mm long, 1.35 mm broad, yellowish brown, sparsely hairy; posterior femora relatively slender, femur 11.00 mm long, 3.00 mm broad, yellowish to dark brown, densely hairy; tibia 9.00 mm long, 0.45 mm broad, yellowish to dark brown, densely hairy, armed with 16 reddish brown tibial spines; tarsus 3 segmented, 6.00 mm long, 0.64 mm broad, dark brown, yellowish brown tarsal denticles in a row; 1<sup>st</sup> tarsal segment 4.00 mm long, 0.30 mm broad; 2<sup>nd</sup> tarsal segment 0.41 mm long, 0.33 mm broad; 3<sup>rd</sup> tarsal segment 1.33 mm long, 0.20 mm broad; claw dark brown.

**ABDOMEN:**

Abdomen 8.00 mm long, 4.00 mm broad, tapering to posterior side, 10 segmented, brown above yellowish beneath; anal cerci (fig.90) 6.00 mm long, dark brown, densely hairy.

**Genitalia (Fig. 91 and 92):**

Superior part of pseudepiphallus 1.16 mm long, 0.28 mm broad; lateral rod 1.33 mm long, 1.13 mm broad, lateral rod less acute; inferior part of pseudepiphallus 0.38 mm long, 0.1 mm broad, pointed, reddish brown.

**COLOUR:**

**Dark brown to blackish:** Occiput.

**Black:** Clypeus.

**Faint brown:** Compound eyes.

**Yellowish brown:** Ocelli, tegmina, hind wing, mid leg trochanter, claw, hind leg coxa, trochanter, tarsal denticles.

**Reddish Brown:** Antennae, mid leg tarsal denticles, hind leg tibial spines.

**Yellowish to dark brown:** Maxillary palpi, thorax, fore leg tibia, hind leg femur, tibia, abdomen.

**Dark brown:** Labrum, fore leg coxa, trochanter, femur, tibial spines, tarsus, claw, mid leg coxa, femur, tibia, tibial spines, tarsus hind leg tarsus, claw, anal cerci.

**HOLOTYPE:** Male, India, Maharashtra, Coll. 27-X-2006; Awate Manisha; antenna, wings, cerci, genitalia, on slide labeled as above; other parts with pinned form, labeled as above.

**PARATYPE:** 8 ♂, 3 ♀, Coll. from 3-VI-2006 to 30-XI-2007 same data as above.

**DISTRIBUTIONAL RECORD:** 3 ♂ Gaganbawada, 15-VIII-2006; 2 ♂ Kolhapur, 10-X-2006; 1Kagal 29- VI-2006; 2 ♂ Hatkangale, 31-VIII-2006; 1 ♂Ajara, 20-VIII-2007; 2♀ Bhudargad, 15-VI-2007.

## ETYMOLOGY

The mirror of the species is more or less pentagonal in shape hence the name *Gryllus pentagoni* sp. nov.

## REMARKS

According to the key of Chopard (1969) and Vasanth (1993) *Gryllus pentagoni* sp. nov. runs close to *Gryllus gracilipes* Saussure by having following characters.

1. Abdomen brown above yellowish beneath.
2. Tegmina without whitish spot.
3. Femora slender.

However, it differs from the above species by having following characters.

1. No yellowish spot between the ocelli and eyes.
2. Posterior tibiae shorter than femora.
3. Posterior tibia armed with 8 spines instead of 6 to 7 spines.
4. Mirror is more or less pentagonal not rounded.

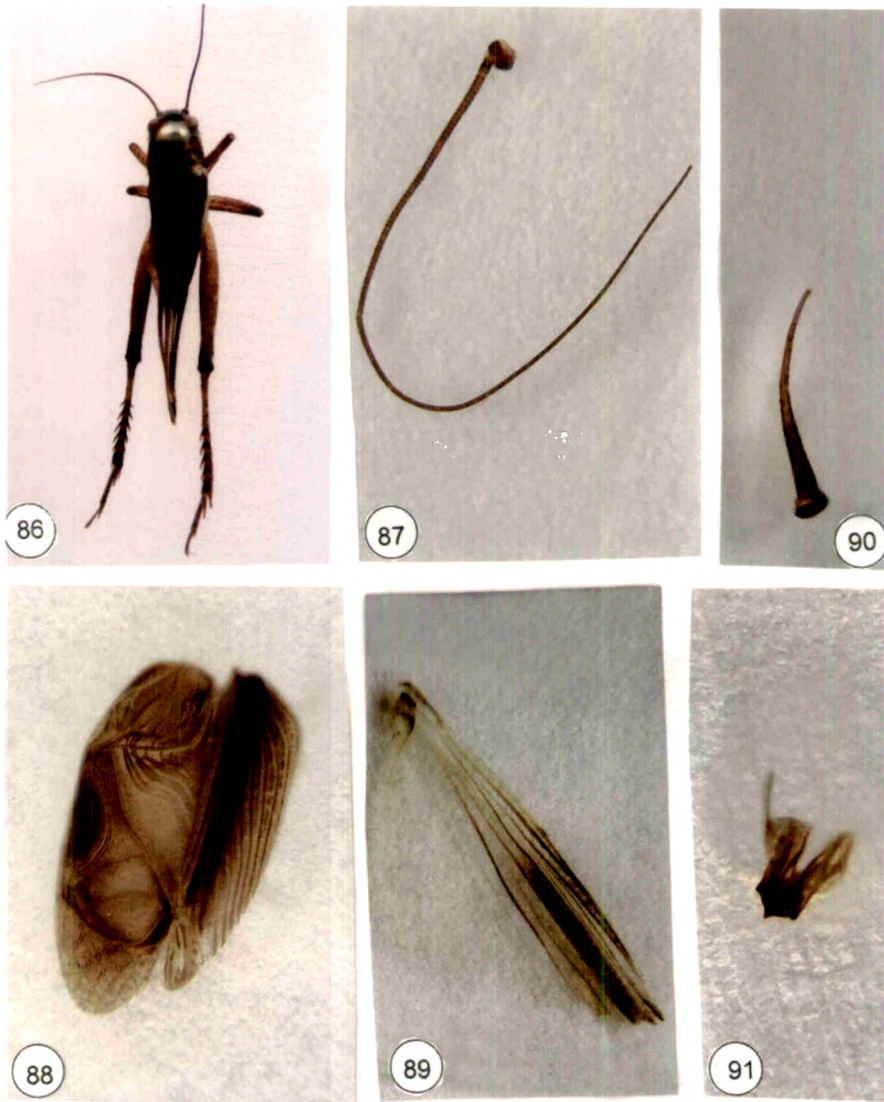
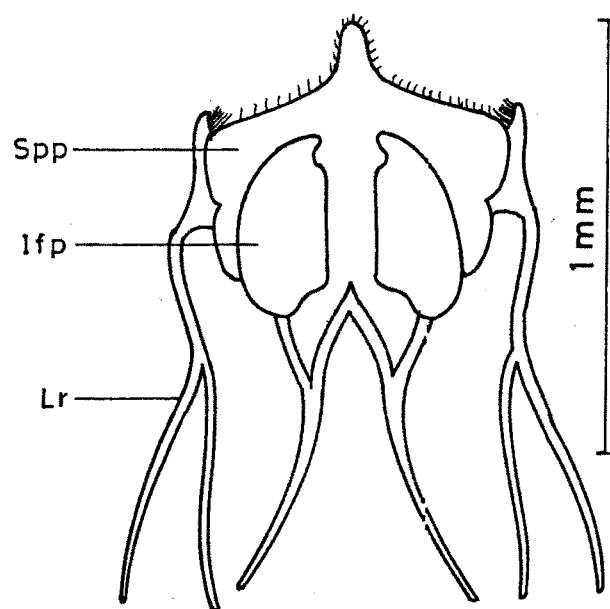


PLATE-14: *Gryllus pentagoni* sp.nov. Fig.86:  
 Adult Male Fig. 87: Antenna Fig.88: Tegmina  
 Fig. 89: Hind wing Fig. 90: Anal cerci Fig. 91:  
 Genitalia



Spp = Superior part of  
Pseudepephallus  
Ifp = Interior part of  
Pseudepephallus  
Lr = Lateral rod

Fig.92 - Genitalia of Gryllus pentagoni sp.nov.



5. Apical field presenting 6 veins.
6. Subcosta bearing 8 branches instead of 5.
7. Inferior part of pseudepiphallus pointed and lateral rod less acute.
8. Flagellar formula:  
 $1=L/W=0.92$ ,  $15=L/W=0.64$ ,  $Ts=L/W=1.8$ ,  $A=1.12$

**GRYLLUS LANCEOLATI SP.NOV.****FEMALE (Fig. 93):**

Body colouration black, convex, elongate, pubescent, 15.00 mm long excluding anal appendages, head 3.00 mm long, thorax 5.00 mm long, tegmina 8.00 mm long, hind wing 15.00 mm long; abdomen 7.00 mm long, blackish; anal cerci 7.00 mm long, yellowish brown; ovipositor 11.00 mm long, reddish brown.

**HEAD:**

Head shining with a narrow yellow band, 3.00 mm long, 4.00 mm broad, rounded; occiput brownish black, head adorned with light bands of the occiput; compound eyes faint brown, ocular distance 1.21 mm, interocular distance 2.00 mm; head with transverse yellow band between ocelli, 3 ocelli disposed as a triangle, yellowish white, circular, ocellar distance 0.34 mm, interocellar distance 0.86 mm; head with wide frontal rostrum, antennae on frontal rostrum, face convex; clypeus

dark brown to blackish, triangular, 1.08 mm long, 0.62 mm broad; labrum yellowish brown, semicircular, 1.00 mm long, 2.00 mm broad; maxillary palpi yellowish to dark brown, cylindrical, 4.00 mm long, 0.28 mm broad, 5 segmented.

**Antenna (Fig. 94):**

16.00 mm long, 0.57 mm broad, yellowish brown; scape 0.52 mm long, 0.57 mm broad; pedicel 0.22 mm long, 0.13 mm broad; flagellum 157 segmented, 17.00 mm long, 0.10 mm broad; 1<sup>st</sup> segment 0.10 mm long, 0.17 mm broad; 15<sup>th</sup> segment 0.10 mm long, 0.12 mm broad; terminal segment 0.08 mm long, 0.05 mm broad.

**Flagellar formula:**

$1=L/W=0.58$ ,  $15=L/W=0.83$ ,  $Ts=L/W=1.6$ ,  $A=1.00$

**THORAX:**

6.00 mm long, 4.00 mm broad, dark brown to black, densely hairy, pronotum dark, lateral lobes rectangular.

**Tegmina (Fig.95):**

Female with more perfectly developed tegmina, never reduced to small lateral pads, tegmina long, narrow, not covering the tip of abdomen, 8.00 mm long, 4.00 mm broad, blackish.

**Hind wing (Fig. 96):**

15.00 mm long, 5.00 mm broad, yellowish brown, wings longer than tegmina.

**Legs:**

Fore leg lighter than body colour; mid leg, hind leg darker than body colour.

**Fore leg:**

7.65 mm long, 0.95 mm broad, coxa 1.26 mm long, 0.95 mm broad, yellowish brown, densely hairy at outer margin; trochanter 0.74 mm long, 0.69 mm broad, yellowish brown, sparsely hairy at outer margin; anterior femora with yellowish marking above, femur 2.00 mm long, 1.00 mm broad, yellowish brown, densely hairy; tibia 2.00 mm long, 0.41 mm broad, 5 yellowish brown tibial spines, yellowish brown, densely hairy; tarsus 3 segmented, 1.65 mm long, 0.26 mm broad, yellowish brown, densely hairy, denticles present in rows; 1<sup>st</sup> tarsal segment 0.83 mm long, 0.20 mm broad; 2<sup>nd</sup> tarsal segment 0.37 mm long, 0.23 mm broad; 3<sup>rd</sup> tarsal segment 0.26 mm long, 0.20 mm broad; claw yellowish brown.

**Mid leg:**

11.55 mm long, 0.74 mm broad, coxa 0.86 mm long, 0.74 mm broad, dark brown, densely hairy at outer margin; trochanter 0.69 mm long, 0.66 mm broad, yellowish brown, sparsely hairy; femur 3.00 mm long, 0.74 mm broad, dark brown to blackish, densely hairy; tibia 4.00 mm long, 0.34

mm broad, dark brown, densely hairy, dark brown 5 tibial spines; tarsus 3 segmented, 3.00 mm long, 0.26 mm broad, yellowish to dark brown, densely hairy, denticles present in rows; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.3 mm broad; 2<sup>nd</sup> tarsal segment 1.16 mm long, 0.18 mm broad; 3<sup>rd</sup> tarsal segment 0.32 mm long, 0.21 mm broad; claw reddish brown.

**Hind leg:**

19.52 mm long, 3.00 mm broad, coxa 2.00 mm long, 3.00 mm broad, yellowish brown, sparsely hairy; trochanter 0.52 mm long, 1.30 mm broad, dark brown, sparsely hairy; femur 7.00 mm long, 2.08 mm broad, yellowish brown to dark brown, densely hairy, posterior femora no longer than tibia and metatarsus together, blakish oblique streaks on the hind femora; posterior tibiae non serrulated at base, tibia 6.00 mm long, 0.48 mm broad, dark brown, 10 dark brown tibial spines, densely hairy; tarsus 3 segmented, 4.00 mm long, 0.29 mm broad, dark brown, densely hairy, denticles present in rows; 1<sup>st</sup> tarsal segment 2.00 mm long, 0.39 mm broad; 2<sup>nd</sup> tarsal segment 1.25 mm long, 0.17 mm broad; 3<sup>rd</sup> tarsal segment 0.41 mm long, 0.22 mm broad; claw reddish brown.

**ABDOMEN:**

7.00 mm long, 3.00 mm broad, tapering to posterior side, dark brown to blackish, 9 segmented; anal cerci (fig.97) 7.00 mm long, yellowish brown; ovipositor (fig.98 and 99) 11.00 mm long, 0.43 mm broad, considerably shorter than body, reddish brown, lanceolate.

**COLOUR:**

**Brownish black:** Occiput.

**Faint brown:** Compound eyes.

**Yellowish white:** Ocelli.

**Blackish:** Tegmina

**Yellowish brow:** Labrum, antennae,  
hind wing, fore leg coxa, trochanter,  
femur, tibia, tibial spines, tarsus,  
claw, mid leg trochanter, anal  
cerci, hind leg coxa.

**Dark brown to blackish:** Clypeus, thorax,  
mid leg femur, abdomen.

**Dark brown:** Mid leg coxa, tibia, hind  
leg trochanter, tibia, tibial spines,  
tarsus.

**Yellowish to dark brown:** Maxillary palpi, mid leg  
tarsus, hind leg femur.

**Reddish brown:** Mid leg claw, hind leg claw,  
ovipositor.

**HOLOTYPE:** Female, India, Maharashtra, Coll.  
17-IX-2007; Awate Manisha;  
antenna, wings, cerci,  
ovipositor on slide labeled  
as above; other parts with pinned  
form, labelled as above.

**PARATYPE:** 7 ♂, 2 ♀, Coll. from 3-VI-2006 to  
30-XI-2007 same data as above.



**DISTRIBUTIONAL RECORD:** 2 ♂ Shirol,  
6-VII-2006; 3♂ Panhala,  
23-VII-2006; 1 ♀ Panhala  
23-VII-2006; 2 ♂ Kagal, 16-IX-2007;  
1 ♀ Kolhapur, 26-VIII-2007.

### ETYMOLOGY

The ovipositor of the species is lanceolate  
hence the name *Gryllus lanceolati* sp. nov.

### REMARKS

According to the key of Chopard (1969)  
and Vasanth (1993) *Gryllus lanceolati*  
sp. nov. runs close to *Gryllus signipes* Walker by  
having following characters.

1. Abdomen brown above yellowish beneath.
2. Tegmina without whitish spot.
3. Femora slender.

However, it differs from the above species by  
having following characters.

1. Black body colouration.

2. Blackish streaks on the hind femora.
3. Head shining with a narrow yellow band.
4. Pronotum dark.
5. Tegmina is blackish no brown and not covering the tip of abdomen.
6. Ovipositor considerably shorter than body.
7. Proportion of cerci to ovipositor.
8. Proportion of posterior tibia to femur.
9. Anterior femora with yellowish marking above instead of black.
10. Flagellar formula:

$$1=L/W=0.58, 15=L/W=0.83, Ts=L/W=1.6, A=1.00$$

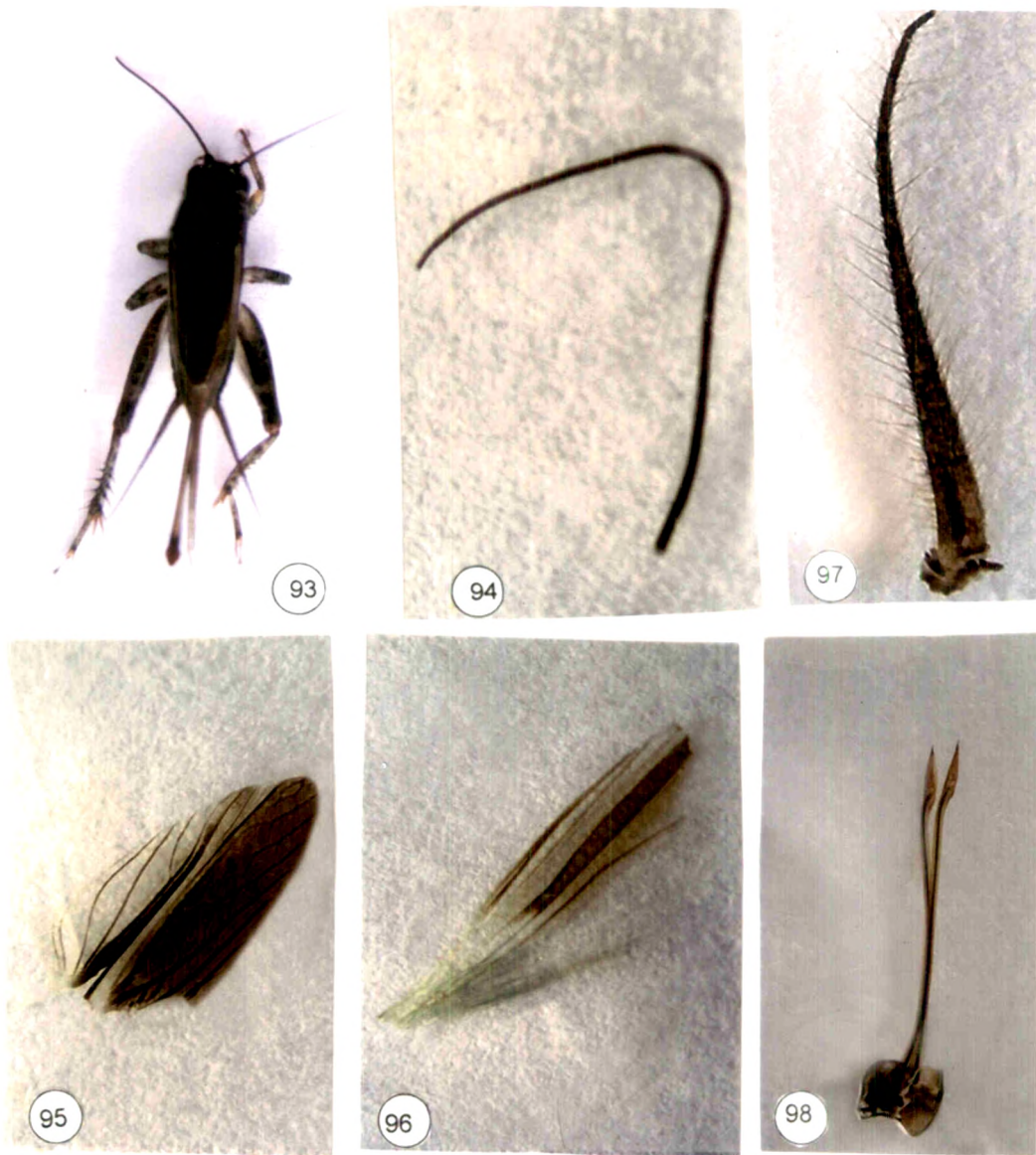


PLATE-15: *Gryllus lanceolati* sp.nov. Fig.93: Adult Female Fig. 94: Antenna Fig.95: Tegmina Fig. 96: Hind wing Fig. 97: Anal cerci Fig. 98: Ovipositor .

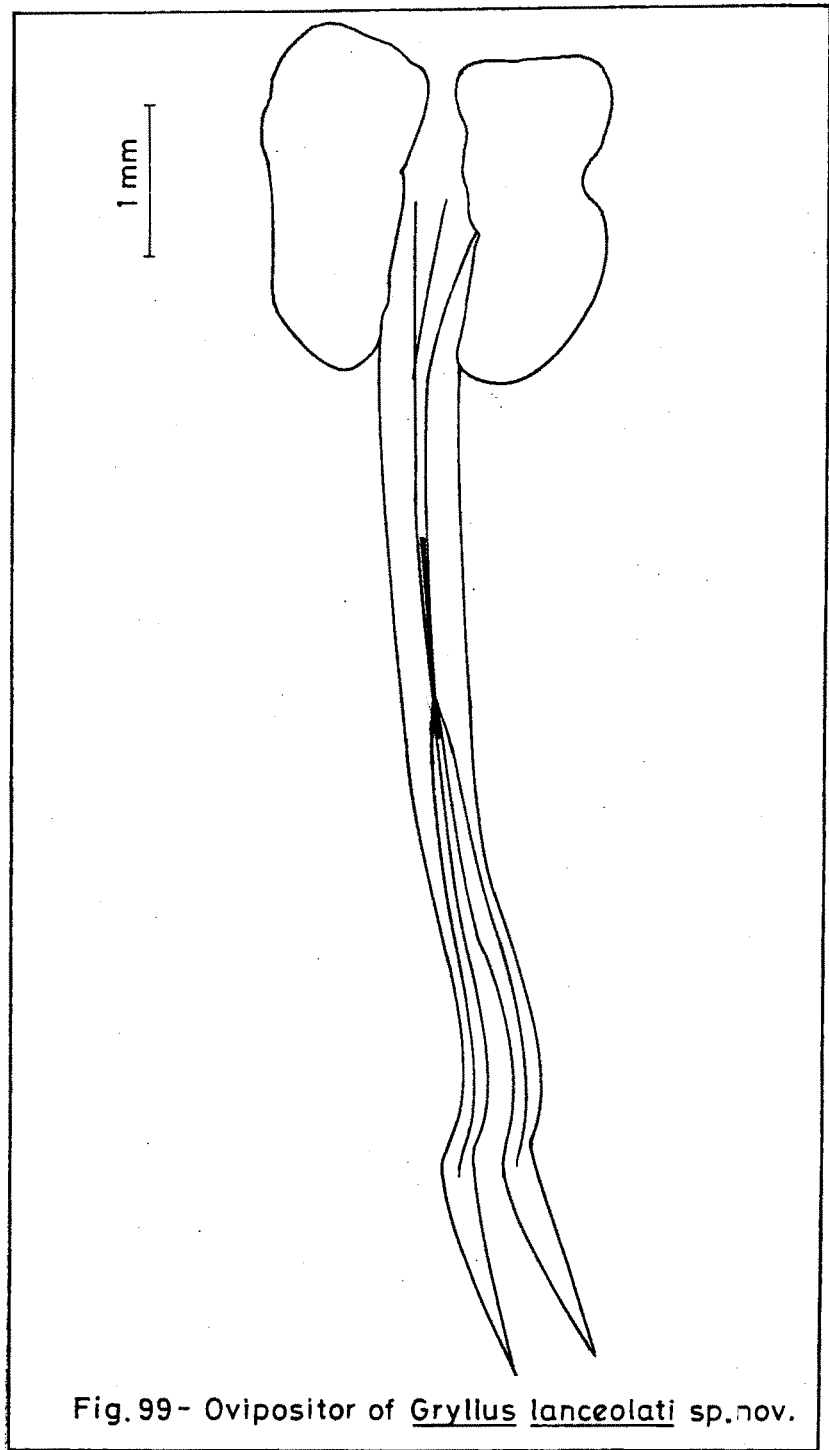


Fig. 99 - Ovipositor of Gryllus lanceolati sp. nov.