

# Systematic Account of Oedipodinae (Acrididae: Orthoptera) of Malaysia With The Description of A New Species

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**Abstract.**- This manuscript represents the identification of 7 species of Oedipodinae (Acrididae) under 6 genera, including *Heteropternis sarimahii* sp. nov. from Malaysia. Three species viz., *Heteropternis respondens* (Walker, F.), *Pternoscirta caliginosa* (Haan) and *Gastrimargus marmoratus* (Thunberg) are recorded for the first time from Malaysia. In addition, a key of the local genera has also been constructed.

**Key words:** Acrididae, Oedipodinae, new species, genitalia, epiphallus, Malaysia.

## INTRODUCTION

Many earlier workers (Kirby, 1914; Willemse, 1930, Bei-Bienko and Mishchenko, 1951; Johanston, 1956; Kevan, 1966; Uvarov, 1977; Bhowmik, 1985, 1986; Mahmood and Yousuf, 1999; Willemse, 2001) conducted a good deal of taxonomic work on the Oedipodinae of Indo-Malaysian region and adjacent areas, but no systematic account exists exclusively for Malaysia. The present study focuses on the Oedipodinae of Malaysia. Willemse (1930) recorded 7 species of Oedipodinae from whole of the Indo-Malaysian region, whereas our collection is also represented by only seven species, including one new to science, under six genera. As our study depends on student collection present in Centre for Insect Systematics (CIS), University Kebangsaan Malaysia (UKM), this number is expected to increase significantly if more extensive survey is undertaken.

### Key to the genera of Malaysian Oedipodinae

1. Median carina of pronotum slightly cut by the transverse grooves; occiput smooth ..... 2

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- Median carina of pronotum deeply cut by the transverse grooves where it seems bifid; occiput with a pair of tubercles between eyes..... *Trilophidia* Stål
2. Inner pair of spurs of hind tibia normal, both are of equal size and weakly curved ..... 3
- Inner pair of spurs of hind tibia long, distinctly bent at the apex; ventral spur almost 2 times longer than dorsal spur ..... *Heteropternis* Stål
3. Veinlets of the apical part of elytra oblique .....  
..... *Pternoscirta* Saussure
- Veinlets of the apical part of elytra perpendicular ..... 4
4. Pronotum tectiform with anterior and posterior margins acute angular; spurious median vein closer to M than to CuA..... *Gastrimargus* Saussure
- Pronotum slightly tectiform or saddle shaped with rounded anterior and posterior margins; intercalary vein closer to CuA or equidistant between CuA and M..... 5
5. Body large, ventrally covered with dense long hairs; foveolae absent ..... *Locusta* Linnaeus
- Body medium, ventrally covered with less dense short hairs; foveolae present, trapezoidal..... *Aiolopus* Fieber

## SYSTEMATIC ACCOUNT

Genus: *TRILOPHIDIA* Stål 1873

Type species: *Oedipoda cristella* Stål 1860  
*Trilophidia annulata* (Thunberg)

Our specimens agree fairly well with the published

description of Hollis (1965) of this species. Some additional characters may be added in his description; male antennae filiform, 21-segmented with terminal portion black; lateral ocellus present adjacent to foveola; basal disc of wing varying from greenish yellow to hyaline; hind femur with 2 broad black spots on dorsal surface, one near knee and other in middle, and a further spot at base; hind tibia with yellow bands; male cercus short, conical, pilose; supra-anal plate lanceolate; sub-genital plate short up curved; female ovipositor valves short narrow, pointed, hooked. It is a confusing species represented by different populations having color, morphological and some genetic variations (Wang, 2000).

*Measurements (mm), 5 males, 5 females*

Male. Total body length, 14-16; pronotum length, 3-3.5; pronotum width, 2.5-3; tegmen length, 17; tegmen width, 2.5-3; hind femur length, 8-9; hind tibia length, 7-8. Female. Total body length, 16-22; pronotum length, 3.5-4; pronotum width, 3-3.5; tegmen length, 18-22; tegmen width, 3.5-4; hind femur length, 9-11; hind tibia length, 7-9.

*Material examined*

Malaysia, Johor: Segamat, Desa Temu Jodoh, 9.VIII.1998, Noormala, 1 male. Negeri Sembilan: Gemenchah, 21.VII, 1990, Zaidi & Ismail, 1 male; Gemenchah, 28.VII.1990, Zaidi & Ismail, 1 male; Port Dickson, 11.I.1993, Zaidi & Ismail, 1 male. Selangor: Bangi, UKM, 19.IX.1998, Soh Pen How, 1 female; Bangi, UKM, 19.IX.2004, Nur AZurah, 1 female; Bangi, UKM, 2.VII.1998, Nooraidah, 1 male; Sungai Baru, 6.IX.1998, Shamsuddin Andong, 1 male; Taman Templer; 10.I.1993. Marzu, 1 female; Taman Templer, 24.I.1992, Amin, 1 female; Hutan Simpan, 5.XI.2004, Shareeza Azzura, 1 female; Bangi, UKM, 28.VIII.1998, Rozana Sulaiman, 1 female; Seksyen 17, Petaling Jaya, 4.I.1977, Normale, 1 male; Bangi, UKM, 6.IX.2002, Poh Lay San, 1 female; Bangi, UKM, 20.VIII.2002. Wong Chun Yinn, 1 male; Kelang, 23.VIII.1998, Kam Poi Ling 1 female; Bukit Cahaya, 15.II.1992, Zulkarnain, 1 female; Bangi, UKM, 15.I.1985, Zuraidah Ahmad, 1 female; Bangi, UKM, 17.II.1990, T. Patrick, 1 female; Sg. Congkak,

12.IX.2004, M.N. Faizah, 1 male; Kajang, 19.VII.2003, Siti Noraini, 1 female; Kajang, 19.VII.2004, Ahmad Lougman, 1 female; Klang, 9.VIII.2003, A. Kalaivani, 1 female; Bangi, UKM, 16.VII.2004, Wong Yen Ching, 1 male. Perak: Temenggor Ekspedisi, 29.XI.1993, Yusof & Ismail, 1 male; Gopeng, 21.VIII.2004, Mohd Azrol, 1 male; Ipoh, 12.IX.1998, Ong Shiu Yin, 1 male; Sg. Siput, 8.VII.2004, Lai Kok Fooi, 1 female. PAHANG: Kuala Lompat, 18.VII.2003, Zawatil Isyai Mohmad Zaini; Kuala Lipis, 19.VII.2002, Tey Siam Chun, 1 male; Kuala Lompat, 18.VII.2003. Siti Noraini, 2 females; Kuala Lompat, 19.VII.2003, Nor Aziah, 1 male; Bukit Fraser, 29.VIII.2003, Faizah Rabir, 1 female; Kuala Lompat, 18.VII.2003, Siti Noraini, 1 female; Endau Rompin, 27.VIII.2004, Ang Shiau Bin, 1 male; Endau Rompin, 21.VIII.2004, Nadia Hani Jahaya; Kuantan, 31.VI.2003, Halimaton, 1 female; Tasik Chini, 17.VII.2004, Helena Alik, 1 male; Kuala Lompat, 19.VII.2003, Mizdilala Mohsin, 1 male, 1 female; Endau Rompin, 19.VII.2002, Oo Kwee Leng, 1 male; Kuala Lompat, 19.VII.2003, Ernie, 2 males; Endau Rompin, 19.VII.2003, Hasaruddin, 1 male; Endau Rompin, 19.VII.2002, M. Sharil Lizan, 1 female; Kuala Lompat, 19.VII.2003, Irdayu Binti Hairani, 1 male; Bukit Fraser, 29.VII.2003, Shahlinney Lipeh, 1 female; Endau Rompin, 19.VII.2002, Chong She Whua, 1 male; Tasik Chini, 22.V.2004, Norhazizi, 2 males; Endau Rompin, 21.VII.2004, 2 females, Shareeza Azzura; Kuala Lompat, 2.IV.1986, 1 male; Tasik Chini, 30.VII.2004, Ong Ee Lan, 1 female; Hutan Endau Rompin, 28.VII.2004, Fadila A Mlaike, 1 female; Bukit Rengit, 21.I.1992, 1 female; Taman Negara Endau Rompin, 30.VII.2004, Tan Sook Koon, 1 male; Endau Rompin, 27.VII.2004, Tan Su Jiuang; Lipur Lentang, 16.IX.2004, Tan Chee Kang, 1 male; Endau Rompin, 14.VII.2004, Gerald, 1 male. KEDAH: Bandar Baharu, 21.VIII.2004, Hassan, 1 male. Pulau Pinang: Kepala Batas, 10.VIII.2002, Lian Bin Hsia, 1 male 1 female; Botanical Garden, 24.VII.2004, Ong Ee Lan, 1 female. Terengganu: Hutan Sekayu, 29.VII.2004, Siti Farhana Binti Ismail, 1 female; Kg. Kemat, 16.VIII.2004, Suzilawati Ramzan; Hutan Lipur Belatan, 28.VIII.2004, Norsham Bt Shamsuddin, 1 female; Hutan Lipur Belatan, 26.VIII.2004, Lee Yee Ceak, 1

female; Hutan Lata Tembakau, 27.VII.2004, Chang Siew Voon, 1 female. Sarawak: Matang, Lotong, 19.VIII.1983, Zakiah Abas, 1 male.

*Habitat*

The specimens of this species have been collected from green fields having small grasses, along roadsides and from palm oil fields. It has been reported that *Trilophidia* is essentially a geophilous genus living in saturated grasslands, grassland savanna, irrigated area and areas of sparse vegetation (Chelser, 1938; Joyce, 1952; Chapman, 1962).

*Geographical distribution*

This is a widely distributed species reported from Pakistan, India, China, whole Indo-Malaysian region, Philippine and Japan.

*HETEROPTERNIS* Stål 1873

Type species: *Acridium respondens* (Walker, 1859)

*Heteropternis respondens* (Walker, 1859)

We have only 1 female specimen of this species that completely agree with the published description of (Kirby, 1914; Willemse, 1930; Bei-Bienko and Mishchenko, 1951) this species except with slight variation in measurements.

*Measurements (mm): 1 female*

Total body length, 24; pronotum length, 5; pronotum width, 4; tegmen length, 22; tegmen width, 4; hind femur length, 14; hind tibia length, 12.

*Material examined*

Malaysia. Selangor: Bangi, UKM, 23.VIII.2004, Mastura, 1 female. Terengganu: Lata Belatan, 28.VIII.2004, Suzlin Abdullah, 1 female (immature specimen).

*Geographical distributions*

This is widely distributed species throughout India and Indo Malaysian region (Willemse, 1930; Bei-Bienko and Mishchenko, 1951).

*New record*

This species has been recorded first time from Peninsular Malaysia.

*Heteropternis sarimahii*, new species  
(Figs. 1 A-E)

*Holotype, female*

Size medium, general coloration brown, body smooth finely pitted.

*Head:* face perpendicular; frontal ridge broad smooth, flat, slightly narrowed between antennae; median ocellus small present distinctly below lower margin of antennae (Fig. 1A); antennae filiform, slender, long, longer than head and pronotum together; foveolae triangular, shallow; lateral ocelli present adjacent to the lower margins of the foveolae; eyes short, oval, prominent; vertex smooth, broad with obliterated flat margins, interocular space distinctly less than half width of eye (Fig. 1B); dorsum of pronotum with a white strip which starts from fastigium and ends at posterior end of pronotum, pronotum short, its length slightly longer than height, posterior margin angularly rounded, median carina low, linear, cut by only one transverse groove, lateral carinae absent (Fig. 1C), posterior margin of lateral lobe rounded (Fig. 1D); tegmina with a row of white spots in median field, spurious median vein present which is closer to CuA than M; wings hyaline slightly yellowish at base; hind femur pale yellow internally, externally light red; hind tibia red with 10 internal and 11 external spine on dorsal margin; meso sternal lobes wider than long, space between them also wide; metasternal lobes widely separated from each others; ovipositor valves smooth, narrow with hooked apices

*Male*

Cercus short, tapering; subgenital plate long narrow; supra anal plate lanceolate; genitalia as in Figure 1E.

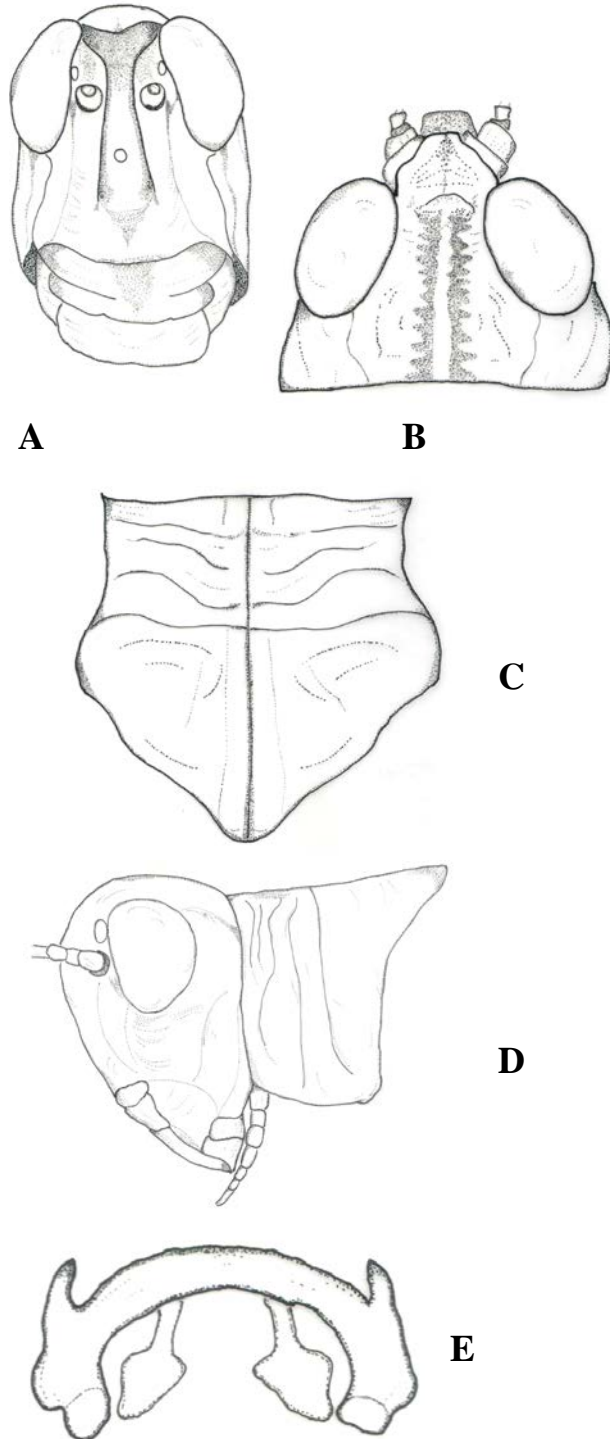
*Measurements (mm) 1 male 1 female.*

Male. Total body length, 18.50; tegmen length, 18.00; head length, 3.00; pronotum, length, 3.50; hind femur length, 10.30; hind tibia length, 8.30. Female. Total body length, 23.50; tegmen length, 21.50; head length, 3.50; pronotum length, 5.00; hind femur length, 12 .50; hind tibia length,

11.00.

*Distinguishing characters*

This species is very near to *H. respondens*



Figs. 1A-E. *Heteropternis sarimahii* sp.

Nov; A, head from front view; B, head from dorsal view; C, pronotum from dorsal view; D, head and pronotum from lateral view; E, epiphallus from dorsal view.

(Walker) but can easily be separated from it in having frontal ridge broad, smooth and flat; median ocellus small present distinctly below lower margin of antennae; dorsum of head and pronotum with a wide white strip which starts from fastigium and ends at the posterior margin of pronotum; oblique white band on lateral side of face below eye absent. We did not compare the genitalia due to the unavailability of male specimen of *H. respondens*.

*Material examined*

Holotype. Sabah: Pulau Gaya, 18.XI.1985, Sarimah Daud, 1 female; Paratype. Sabah: Pulau Gaya, 18.XI.1985, Sarimah Daud, 1 male.

*Derivation of name*

The name of this species has been dedicated to the collector.

*Repository*

The type specimens have been deposited to the Center for Insect Systematic, School of Environmental and Natural Resource Sciences, Faculty of Science and Technology, University Kebangsaan Malaysia.

*PTERNOSCIRTA* Saussure 1884

Type species: *Acridium cinctifemur* Walker  
*Pternoscirta caliginosa* (De Haan)

Our specimens completely agree with the published description of (Willems, 1930; Kirby, 1914; Bei-Bienko and Mishchenko, 1951) of this species except some color variations. Some of our specimens have bright sky blue hind tibia and in some pale yellow.

*Measurements (mm): 5 males 5 females*

Male: Total body length, 18-22; pronotum length, 4-4.50; pronotum width, 3-4; tegmen length, 18-22; tegmen width, 3-4; hind femur length, 16-18; hind tibia length, 9-11. Female. Total body length,

24-27; pronotum length, 5-5.50; pronotum width, 4-5; tegmen length, 25-27; tegmen width, 4-4.50; hind femur length, 15; hind tibia length, 13.

*Material examined*

Malaysia. Johor: Mersing, Pulau Babi Hujung, 15.VIII.1974, N.D. Jaga, 1 male. Selangor: Jugra, 28.VIII.2004, Zaheera, Z., 1 male; Tengah, 7.VIII.2004, Jaring Sapuan, 1 male; Kajang, Taman Tenaga, 14.IX.2004, Lee Choy Mooi, 1 female; Bangi, UKM, 3.II.1983, Musirahsirim, 1 female; Bangi, UKM, 20.VIII.2003, Koh Ann Jee, 1 female. Perak: Pulau Pangkor, 23.VII.1975, 1 female. Pahang: Bukit Fraser, 29.VIII.2003, Faizah Rabir, 1 male; Kuala Lompat, 18.VII.2003, Zawatil Isyqi Mohamad Zaini; Kuala Lompat, 30.I.1993, Delilah, 1 male. PULAU PINANG: Taman Belia, 26.IX.2004, Lye Li Har, 1 female. Terengganu: Lata Belantan, 26.VIII.2004, 1 female.

*Geographical distribution*

This species has been reported from South China, India, Kashmir and Indonesia. We confirm and accept its distribution and presence in Malaysia.

*New record*

This species has been recorded first time from Malaysia.

*GASTRIMARGUS* Saussure 1884

Type species: *Gryllus virescens* Thunberg  
*Gastrimargus marmoratus* (Thunberg 1815)

Our specimens completely agree with the published description (Kirby, 1914; Willemse, 1930; Bie-Bienko and Mishchenko, 1951; Ritchie, 1982; Zheng *et al.*, 1999) of this species. This species is a strong flier and produce a crackling sound during flight. This species is also found in two color morphs *i.e.* brown and green. In green form hind tibia is bright red while in brown form it is pale red. In green form black band of hind wing is more bright and clear than the brown form.

*Measurements (mm): 5 males 5 females*

Male. Total body length, 28-29; pronotum length, 7-8; pronotum width, 5-5.50; tegmen length, 29-31; tegmen width, 5.5-6; hind femur length, 19-20; hind tibia length, 17-18. Female. Total body

length, 36-45; pronotum length, 10-11; pronotum width, 7-8; tegmen length, 40-45; tegmen width, 7-8; hind femur length, 25-27; hind tibia length, 23-25.

*Material examined*

Malaysia. Melaka: Bandar Melaka, 21.X.1973, D. Kurtak, 1 male; Kg. Kandang, 17.II.1980, Hassan, 1 male. Negeri Sembilan: Gemencheh, 7.VII.1990, Zaidi & Ismail, 1 male, Gemencheh, 14.VII.1990, Zaidi, Ismail & Zabidi, Gemencheh, 7.VII.1990, Zaidi, Ismail & Zabidi, 1 male 1 female; Gemencheh, 28.I.1989, Kissol, 1 female. Kuala Lumpur: Bangsar, 5.X.1974, Mol, Noh & Jalil, 1 female. SELANGOR: Bangi, UKM, 1.II.1985, Rahimah; Seri Kembangan, UPM, 10.VII.1990, Chin Seet Wah; Taman Templer, 15.VI.1974, W. Litke, 1 female, Kampung Tok Muda, Jeram, 28.VIII.1996, Esparan, 1 female. SARAWAK: Kpg. Serikin, 27.VII.2003, Siti khadijah, 1 female, C. T. Estate, 11.X.1972, S. F. Wong, 1 male. SABAH: Tambunan, 13.IX.1986, Akina Veda, 1 male.

*Geographical distribution*

This is a widely distributed species reported from China, Japan, Korea, Kashmir, Southeast Asia and Africa.

*New record*

This species has been recorded first time from Malaysia.

*LOCUSTA* (Linnaeus)

Type species: *Gryllus migratoria* Linnaeus, 1758.

*Locusta migratoria* (Linnaeus)

We have only three specimens in our collection, which completely agree with the published description (Kirby, 1914; Willemse, 1930; Bie-Bienko and Mishchenko, 1951) of this species except some variations in measurements.

This species is known in two forms or phases *i.e.* solitary and gregarious phase. This phase polymorphism has been reported as density dependent factor (Ayali and Pener, 1992; Ayali *et al.*, 2004). Our specimens key out in both solitary

and gregarious phases on the basis of shape of pronotum. Both sexes of two forms are not available so, we can not compare the morphometrics.

*Locusta migratoria (L.) phase gregaria*

Pronotum saddle shaped with posterior margin broadly angular in female, median carina low, linear; hind tibia in female pale; in female t/f index is 2.08.

*Measurements (mm): 1 female*

Female. Total body length, 48.00; pronotum length, 8.50; head length, 7.00; tegmen length, 50.00; hind femur length, 24.00; hind tibia length, 22.00

*Material examined*

Malaysia. Sabah. Pitus, Kg. Telaga, 1.VII.1989, Akira Veda, 1 female.

*Locusta migratoria (L.) phase solitaria*

Pronotum raised tectiform with angular anterior and posterior margin, median carina in profile arcuate; hind tibia palish brown; in male t/f index is 2.05.

*Measurements 2 males*

Total body length, 36-38; pronotum length, 7-9; pronotum width, 5.5; head length, 5.34; tegmen length, 38-42; tegmen width, 7-7.5; hind femur length, 19.50; hind tibia, 18.50

*Material examined*

Malaysia. Selangor: Bangi, UKM, 16.VII.1983, Zakiah, 1 male. Sabah: Babagon, 14.xii.1983, 1 male.

*Geographical distribution*

This is a widely distributed species reported from Europe, Asia, Africa and Australia.

*AIOLOPUS* Fieber

Type species: *Gryllus thalassinus* Fabricius  
*Aiolopus thalassinus tamulus* (Fabricius)

Our specimens completely agree with the published description (Bei-Bienko and Mishchenko,

1951, Hollis, 1968) of this species. This species is also reported as pest of wheat and paddy in some parts of Asia (Janjua and Khan, 1955; Janjua, 1957).

*Measurements (mm): 5 females.*

Total body length, 28-29; pronotum length, 4-5; pronotum width, 3; tegmen length, 25; tegmen width, 4; hind femur length, 15-16; hind tibia length, 13-14.

*Material examined*

Malaysia. Selangor: Bangi, UKM, 1.III.1985, M. Kamal, 1 female; Bangi, UKM, 18.IX.2004, Aishah Farhana, 1 female, Sekinchan, 14.VIII.2004, Lee Siang Hui, 1 female. Pahang: Endau Rompin, 20.VII.2004, Muhammad Mahdi, 1 female. Sabah. Pulau Gaya, 20.II.1985, M. Kamal, 1 female.

*Geographical distribution*

This is a widely distributed species recorded from Asia, Australia and Africa.

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