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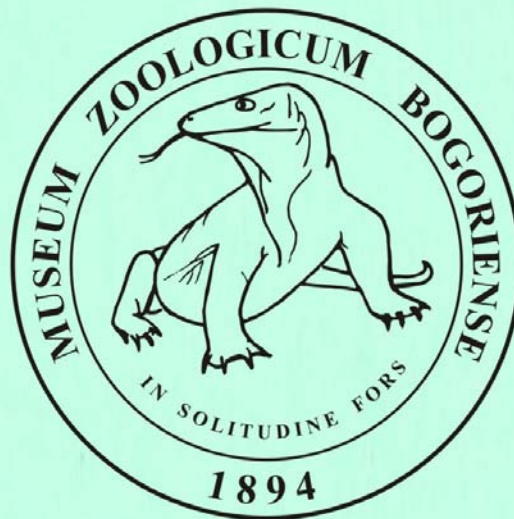
# TREUBIA

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## TREUBIA

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**NOTES ON PARASITIC WASP GENUS *PEDIوبيUS* WALKER  
(HYMENOPTERA: EULOPHIDAE) OF JAVA-INDONESIA,  
WITH FIVE NEW RECORDS**

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**Abstract**

Fourteen species of parasitic wasps in the genus *Pediobius* Walker (Hymenoptera: Eulophidae) are reported from Java, Indonesia, based on existing literatures and an examination of about 130 specimens of the genus newly collected from many localities in Java. The following five species are recorded from Java for the first time: *Pediobius agaristae* (Cameron), *P. aspidomorphae* (Girault), *P. foveolatus* (Crawford), *P. inexpectatus* Kerrich, and *P. viridifrons* (Motschulsky). Detailed citation, hosts, locality records, material examined are given for all species and arranged in alphabetical order.

**Keywords:** Eulophidae, Hymenoptera, Indonesia, Java, *Pediobius*.

**INTRODUCTION**

The genus *Pediobius* Walker, 1846 consist of 200 described species worldwide (Kerrich 1973, Noyes 2006, Hansson 2006). Most of them are very uniformly built, dark metallic to black colored with the size ranging from 0.85 to 2.7 mm. The taxonomy of the Southeast Asian species of *Pediobius* is poorly understood. The only key to species of *Pediobius* which covered the Indonesian fauna was given by Kerrich (1973), but it is not applicable for most species found from Java, and Kamijo (1986) presented the Japanese species of *Pediobius* which included some species that distributed through Java.

The species of *Pediobius* are primary or secondary parasites in eggs, pupae, and sometimes in larvae of other insects and several species develop in egg-sacs of spiders. The insect hosts belong mainly to Coleoptera, Diptera, Hymenoptera and Lepidoptera, and several species attack leaf-mining insects (Bouèek 1988).

While sorting materials of Javanese Eulophidae for the forthcoming revisionary study of Javanese Eulophinae (Ubaidillah *in prep.*), we had the opportunity to check species identities of all *Pediobius* mounted material kept in Museum Zoologicum Bogoriense of Bogor, Indonesia. The present paper is a spin-off from that synoptic work as well as the new materials collected in the last five years and has the following purposes: 1) to provide an up-to-date list of the *Pediobius* species found in Java and 2) to present a critical assessment of the existing literature records from Java.

## MATERIALS AND METHODS

A total of about 130 material examined in this study are mostly new collection, collected from many localities in Java during the project of *Taxa Terpilih – DIPA LIPI* between 2001-2006 and about 21 specimens were old materials. All measurements were made using an ocular micrometer on Olympus-SZX 12 microscope. All specimens were dry mounted in the rectangle card and pointed card. Specimens are deposited in the Zoology Division (Museum Zoologicum Bogoriense) – the Indonesian Institute of Sciences (LIPI), Bogor, Indonesia. Terminology used in this article follows Bouèek (1988) and Gibson (1997).

## RESULTS AND DISCUSSION

### Taxonomy

#### *Pediobius* Walker, 1846

*Entedon* (*Pediobius*) Walker, 1846: 184. Type species *Entedon* (*Pediobius*) *imbreus* Walker, 1846. Subsequent designation by Ashmead (1904: 384).

- Microterus* Spinola, 1811: 151. Type species *Diplolepis petiolatus* Spinola, 1808. Subsequent designation by Gahan & Fagan (1923: 173). Synonymized with *Pediobius* by Bouèek (1988: 701).
- Pleurotropis* Förster, 1856: 78. Type species *Pleurotropis isomerus* Förster, 1856 by monotypy and subsequent designation. Synonymized with *Pediobius* by Ferriere (1954: 400).
- Rhopalotus* Förster, 1856: 78. Type species *Elachertus cothurnatus* Nees, 1834. Subsequent designation by Ashmead (1904: 225). Synonymized with *Pediobius* by Bouèek (1965: 5).
- Spartiophilus* Rondani, 1872: 208. Type species *Spartiophilus bruchicida* Rondani, 1872 by monotypy. Synonymized with *Pediobius* by Bouèek (1974: 265).
- Heptomerus* Rondani, 1874: 133. Type species *Heptomerus caeruleonitens* Rondani, 1874 by original designation. Synonymized with *Pediobius* by Bouèek (1974: 252).
- Cluthaira* Cameron, 1912: 211. Type species *Cluthaira agaristae* Cameron, 1912 by monotypy. Synonymized with *Pediobius* by Bouèek (1965: 5).
- Pseudacrias* Girault, 1913: 104. Type species *Pseudacrias micans* Girault, 1913 by monotypy and original designation. Synonymized with *Pediobius* by Burks (1958: 68).
- Mestocharoides* Girault, 1913: 142. Type species *Mestocharoides cyaneus* Girault, 1913 by monotypy and original designation. Synonymized with *Pediobius* by Bouèek (1988: 701).
- Chrysoatomoides* Girault, 1913: 144. Type species *Chrysoatomoides latipennis* Girault, 1913 by monotypy and original designation. Synonymized with *Pediobius* by Bouèek (1988: 701).
- Amestocharis* Girault, 1913: 146. Type species *Amestocharis goondiensis* Girault, 1913 by original designation. Synonymized with *Pediobius* by Bouèek (1988: 701).
- Epacrias* Girault, 1913: 154. Type species *Epacrias nigriviridis* Girault, 1913 by monotypy. Synonymized with *Pediobius* by Bouèek (1988: 701).
- Entedonomyia* Girault, 1915: 185. Type species *Entedonomyia platoni* Girault, 1915 by monotypy and original designation. Synonymized with *Pediobius* by Bouèek (1988: 701).
- Neopseudacrias* Girault 1915: 187. Type species *Neopseudacrias splendidus* Girault, 1915 by monotypy and original designation. Synonymized with *Pediobius* by Bouèek (1988: 701).

- Entedonopseus* Girault, 1915: 188. Type species *Entedonopseus tricoloripes* Girault, 1915 by monotypy. Synonymized with *Pediobius* by Bouèek (1988: 701).
- Horismenopsis* Girault, 1915: 234. Type species *Horismenus antiopa* Girault, 1915 by original designation. Synonymized with *Pediobius* by Bouèek (1988: 701).
- Mestocharomyia* Girault, 1915: 188. Type species *Mestocharis lividus* Girault, 1915 by original designation. Synonymized with *Pediobius* by Bouèek (1988: 701).
- Eupleurotropis* Girault, 1917: 3. Type species *Pleurotropis testaceipes* Girault, 1917 by monotypy. Synonymized with *Pediobius* by Peck (1951: 410).
- Epipleurotropis* Girault, 1917: 7. Type species *Epipleurotropis longfellowi* Girault, 1917 by monotypy. Synonymized with *Pediobius* by Burks (1958: 62).
- Pseudacriasoides* Girault, 1917: 9. Type species *Pleurotropis utahensis* Girault, 1917 by monotypy. Synonymized with *Pediobius* by Burks (1958: 62).
- Mesentedon* Girault, 1920: 39. Type species *Mesentedon hallami* Girault, 1920 by monotypy. Synonymized with *Pediobius* by Bouèek (1988: 701).

***Pediobius agaristae*** (Cameron, 1912)

- Cluthaira agaristae* Cameron, 1912: 211. Type species *Cluthaira agaristae* Cameron, 1912. Synonymized with *Pediobius agaristae* by Bouèek (1965: 7).
- Entedonomyia platoni* Girault, 1915: 185. Type species *Entedonomyia platoni* Girault, 1915. Synonymized with *Pediobius agaristae* by Bouèek (1988: 702).
- Entedonopseus tricoloripes* Girault, 1915: 185. Type species *Entedonopseus tricoloripes* Girault, 1915. Synonymized with *Pediobius agaristae* by Bouèek (1988: 702).

**Host records.** *Agarista glycine*, *Eudocima fullonia* (Lepidoptera: Noctuidae), *Euplectrus agaristae* (Hymenoptera: Eulophidae) (Noyes 2002).

**Distributions.** Indonesia: **Java (NEW RECORD)**; India: Maharashtra; Australia: New South Wales, Queensland.

**Remarks.** All Javanese specimens of *P. agaristae* were mainly found in shrub habitats at the forest edges with altitudes ranging from 98-1130 m. Individuals

of this species have variations on length of reticulation between anterior half to more than half the length of scutellum. The species has been recorded as a parasitoid of noctuid moths *Agarista glycine*, *Eudocima fullonia* (Clerck), the latter known as *Ophioderes fullonia* Clerck by the collector. This species is also known a hyperparasite of eulophid wasps *Euplectrus agaristae*.

**Material examined.** *West Java*: 1♂ (MZB) G Halimun NP, Cikaniki, track to G Kendeng near Plot 2, 12.viii.1997, 06°45'04.9°S 106°31'31.7°E, 960 m asl, Ubaidillah R, sweeping net; 1♂ (MZB) Bogor, Cibinong, Km.46, front of Widyastwaloka LIPI, 6.iv.2001, Ubaidillah R, sweeping net; 1♂ (MZB), G Halimun NP, Cisalimar, Forest border, open area, 25.iv.2001, 06°44'91.1°S 106°32'25.8°E, 850 m asl, Ubaidillah R, sweeping net; 1♂ (MZB), G Halimun NP, Cikaniki, track after forest gate to Cikaniki, 25.iv.2001, 06°44'91.1°S 106°32'25.8°E, 960 m asl, Ubaidillah R, sweeping net; 2♂ (MZB), G Halimun NP, G Botol, Forest edges, 26.iv.2001, 06°42'20.7°S 106°29'04.1°E, 1500 m asl, Ubaidillah R, sweeping net; 3♂ (MZB), T.N. Gede Pangrango, Sukabumi, Bodogol, track from Kantor Resort to Station Riset, 10.v.2005, 800 m asl, Ubaidillah R & Darmawan, sweeping net; 2♂ (MZB), Ciarnis, Panjalu, Dukuh, Situ Lengkong, 18.vi.2005, 07°09'S 108°16'E, 800 m asl, Sutrisno H & Cholik E, sweeping net; 2♂ (MZB), Ciarnis, Panjalu, Panambungan, 19.vi.2005, 07°08'S 108°15'E, 800 m asl Ubaidillah R & Darmawan, sweeping net; 2♂ (MZB), GHSNP, Sukagalih, Cipeuteuy, Sawah, Ladang, 21.v.2006, 750 m asl, Ubaidillah R & Darmawan, sweeping net; 1♂ (MZB), GPNP, Sukabumi, Salabintana track to Camp III. 25.v.2006, 06°50'S 106°57'E, 1.130 m asl, Ubaidillah R & Darmawan, sweeping net. *Central Java*: 2♂ (MZB), Purwokerto, Batur Raden, track from Kebun Raya Track to Pancuran Tujuh, 28.iii.2006, 109°11'S 07°17'E, 800 m asl, Ubaidillah R & Darmawan, sweeping net; 6♂ (MZB), Purwokerto, Batur Raden, track from Kebun Raya Track to Pernalang, 29.iii.2006, 109°15'S 07°17'E, 800 m asl, Ubaidillah R & Darmawan, sweeping net; 1♂ (MZB), Cilacap, Nusakambangan, Sodong Kali Nyamuk, 31.iii.2006, 07°45'S 108°56'E, 107 m asl, Ubaidillah R & Darmawan, sweeping net; 2♂ (MZB), Cilacap, Nusakambangan, Sodong Limus Buntu, 31.iii.2006, 07°44'S 108°56'E, 98 m asl, Ubaidillah R & Darmawan, sweeping net; 1♂ (MZB), Cilacap, Nusa Kambangan, track from Karang Tengah to Benteng, 01.iv.2006, 07°43'S 108°34'E, 98 m asl, Ubaidillah R & Darmawan, sweeping net. *D.I. Yogyakarta*:

3♂ (MZB), Sleman, Pakem, Purwobinangun, Turgo Atas, 25.iii.2005, 07°35'S 110°25'E, 1100 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net; 1♂ (MZB), Sleman, Pakem, Purwobinangun, Turgo Atas, 13.vii.2005, 07°35'S 11°25'E, 100 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net; 1♀, 4♂ (MZB), Sleman, Pakem, Purwobinangun, Turgo Atas, 13.vii.2005, 07°35'S 110°25'E, 1.100 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net; 1♀, 3♂ (MZB), Sleman, Pakem, Purwobinangun, Turgo Bawah, 14.vii.2005, 07°35'S 110°24'E, 910 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net; 1♀, 3♂ (MZB), Sleman, Pakem, Purwobinangun, Turgo Bawah, 15.vii.2005, 07°35'S 110°24'E, 910 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net. *East Java*: 3♂, (MZB), Jember, Tempurejo, Andongrejo, track from T.N Meru Betiri, 02.v.2005, 08°24'S 113°44'E, 264 m asl, Ubaidillah R, Cholik E & Darmawan, sweeping net; 1♂ (MZB), Jember, Tempurejo, Andongrejo, track from T.N Meru Betiri to Bande Alit, 03.v.2005, 08°24'S 113°44'E, 264 m asl, Ubaidillah R, Cholik E & Darmawan, sweeping net.

***Pediobius anomalus*** (Gahan, 1920)

*Pleurotropis anomala* (Gahan), 1920: 343. Type species *Pleurotropis anomala* Gahan, 1920. Transferred to *Pediobius anomalus* by Kerrich (1973: 171).

**Host records.** *Dolichogenidea metesae* (Hymenoptera: Braconidae); *Antispila anna* (Lepidoptera: Heliozelidae), *Metisa plana* (Lepidoptera: Psychidae), *Endelus bakeri* (Coleoptera: Buprestidae), *Promecotheca cummingii* (Coleoptera: Hispidae) (Noyes 2002).

**Plant associate.** *Elaeis guineensis* (Palmae).

**Distributions.** Indonesia: Java; India: Andhra Pradesh; Malaysia; Philippines.

**Remarks.** This species can be easily identified by the key of Kerrich (1973) in the couple of 14 and in his re-description on the species. Among the member of *Pediobius*, the species can be recognized by the combination of characters, the notaular pits separated by a fine median keel, the scutellum smooth in the middle and finely reticulate-striate on the sides; this species has been known as a primary parasitoid of the larvae of buprestid beetle, *Endelus bakeri* and hispid beetle *Promecotheca cummingii* (Kerrich 1973).



**Material examined.** *West Java*: 2♂ (MZB), Ciamis, Panjalu, Panambungan, 19.vi.2005, 07°08'S 108°15'E, 800 m asl, Sutrisno H & Cholik E, sweeping net.

***Pediobius aspidomorphae* (Girault, 1938)**

*Pseudacrias aspidomorphae*, Girault, 1938: 74. Type species *Pseudacrias aspidomorphae* Girault, 1938. Transferred to *Pediobius aspidomorphae* by Kerrich (1973: 128).

**Host records.** Parasite in pupa of cassidine beetles of *Aspidomorpha miliaris* and *A. parummaculata* (Coleoptera: Chrysomelidae) (Kerrich 1973, Noyes 2002).

**Distributions.** Indonesia: Sulawesi, **Java (NEW RECORD)**; Australia: Queensland.

**Remarks.** This species was described by Girault (1938) based on specimens collected from Australia, and first time recorded from Indonesia by Kerrich (1973) with materials collected from Makasar, Sulawesi. The additional material now recorded from Java is a new record from the island.

**Material examined.** *West Java*: 5♂ (MZB), Bogor, Kebun Raya Bogor, 08.v.1995, 250 m asl, Ubaidillah R, sweeping net, ex *Aspidomorpha* (Pupa); 1♂ (MZB), G. Halimun NP, Cikaniki, 24.iv.2001, 06°44'91.1°S 106°32'25.8°E, 960 m asl, Ubaidillah R, under canopy trail, sweeping net; 2♂ (MZB), Bogor, Kebun Raya Bogor, 10.v.2001, 250 m asl, Ubaidillah R, sweeping net; 2♀ (MZB), Ciamis, Dukuh, Situ Lengkong, 18.vi.2005, 07°07'S 108°16'E, 800 m asl, Sutrisno H & Cholik E, sweeping net. *Central Java*: 2♂ (MZB), Cilacap, Nusakambangan, Sodong Kali Nyamuk, 31.iii.2006, 07°45'S 108°56'E, 107 m asl, Ubaidillah R & Darmawan, sweeping net; 4♂ (MZB), Cilacap, Nusakambangan, Sodong Limus Buntu, 31.iii.2006, 07°44'S 108°56'E, 98 m asl, Ubaidillah R & Darmawan, sweeping net; 1♀, 1♂ (MZB), Cilacap, Nusakambangan, track from Karang Tengah to Benteng, 01.iv.2006, 07°43'S 108°34'E, 98 m asl, Ubaidillah R & Darmawan, sweeping net. *D.I. Yogyakarta*: 1♂ (MZB), Sleman, Pakem, Purwobinangun, Turgo Atas, 13.vii.2005, 07°35'S 110°25'E, 1.100 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net; 2♀ (MZB), Sleman, Pakem, Purwobinangun, Turgo Bawah, 14.vii.2005, 07°35'S 110°24'E, 910 m asl, Ubaidillah R, Rofik M &

Darmawan, sweeping net. *East Java*: 1♂, (MZB), Jember, Tempurejo, Andongrejo, T.N Meru Betiri, 02.v.2005, 08°24'S 113°44'E, 264 m asl, Ubaidillah R, Cholik E & Darmawan, sweeping net.

***Pediobius carinaticutum*** (Girault, 1917)

*Pseudacrias carinaticutum* Girault 1917: 1. Type species *Pseudacrias carinaticutum* Girault, 1917. Transferred to *Pediobius carinaticutum* by Kerrich (1973: 170).

*Pseudacrias secundus* Girault, 1917: 7. Type species *Pseudacrias secundus* Girault, 1917. Synonymized with *Pediobius carinaticutum* by Kerrich (1973: 170).

**Host record.** This species was reared from unidentified spider egg-sac (Araneida) (Kerrich 1973).

**Distribution.** Known only from Java, Indonesia.

**Remarks.** *Pediobius carinaticutum* closely related to *P. anomalus*, but differs in having the notaular pits separated by a rather strong median keel, propodeum having submedian carina coalesced in about basal half, cubital hair row starting immediately beyond basalis, tibiae mainly dull stramineous, with some darkening above. Unfortunately, we could not find new collection of this species and the careful study based on the redescription made by Kerrich (1973: 170).

***Pediobius elasmii*** (Ashmead, 1904)

*Asecodes elasmii* Ashmead, 1904: 138. Type species *Asecodes elasmii* Ashmead, 1904. Transferred to *Pediobius* by Baltazar (1966: 116).

*Pleurotropis lividiscutum* (Gahan) 1922: 47. Type species *Pleurotropis lividiscutum* Gahan, 1922. Synonymized with *Pediobius elasmii* by Kerrich (1973: 166).

**Host records.** *Apanteles agilis*, *Dolichogenidea metesae* (Hymenoptera: Braconidae), *Elasmus philippinensis* (Hymenoptera: Eulophidae); *Bessa remota* (Diptera: Tachinidae); *Artona catoxantha* (Lepidoptera: Zygaenidae), *Chilo indicus*, *Proceras indicus* (Lepidoptera: Pyralidae), *Mahasena corbetti*,

*Pteroma* sp. (Lepidoptera: Psychidae), *Sarcophaga* sp. (Diptera: Sarcophagidae), *Attacus atlas* (Lepidoptera: Saturniidae); *Calopepla leayana* (Coleoptera: Chrysomelidae), *Lamprosema camphorae* (Lepidoptera: Pyraustidae) (Noyes 2002).

**Plant associates.** *Cocos nucifera*; *Elaeis guineensis* (Palmae); *Gmelina arborea* (Verbenaceae).

**Distributions.** Indonesia: Sumatra, Java; India: Karnataka, Kerala, Madhya Pradesh; Sri Lanka; Malaysia: Sabah; Philippines; Papua New Guinea; Australia: New South Wales, Queensland.

**Remarks.** This species first recorded from Indonesia by Gahan (1922) as *Pleurotropis lividiscutum* (Gahan) based on female collected from Padang, Sumatra. Kerrich (1973) designated *Pleurotropis lividiscutum* (Gahan) as synonym with *Pediobius elasmii* (Ashmead) based on female reared from the cocoons of braconid wasps, which were collected from Bogor, West Java and he stated as a new record from the island.

**Material examined.** *West Java*: 1 ♀ (MZB), Perhutani, Garut, Leuwipari, 13.vi.2005, 07°41'S 107°50'E, 39 m asl, Ubaidillah R & Darmawan, sweeping net; 1 ♀ (MZB), Ciamis, Panjalu, Garahang, Situ Ciater 16.vi.2005, 07°09'S 108°15'E, 800 m asl Ubaidillah R, & Darmawan, sweeping net; 1 ♀ (MZB), Ciamis, Dukuh, Situ Lengkong, 18.vi.2005, 07°07'S 108°16'E, 800 m asl, Sutrisno H & Cholik E, sweeping net. *Central Java*: 1 ♂ (MZB), Cilacap, Nusa Kambangan, Sodong Limus Buntu, 01.iv.2006, 07°44'S 108°56'E, 98 m asl, Ubaidillah R & Darmawan, sweeping net; 1 ♂ (MZB), Cilacap, Nusakambangan, track from Karang Tengah to Benteng, 01.iv.2006, 07°43'S 108°34'E, 98 m asl, Ubaidillah R & Darmawan, sweeping net. *D.I. Yogyakarta*: 1 ♀ (MZB), Sleman, Pakem, Purwobinangun, Turgo Atas, 13.vii.2005, 07°35'S 110°25'E, 1.100 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net; 1 ♀ (MZB), Sleman, Pakem, Purwobinangun, Turgo Bawah, 15.vii.2005, 07°35'S 110°24'E, 910 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net.

### *Pediobius erionotae* Kerrich, 1973

*Pediobius erionotae* Kerrich, 1973: 178. Type species *Pediobius erionotae* Kerrich (1973: 178).

**Host records.** This species emerge from egg, larva and pupa of *Erionota thrax* (Lepidoptera: Hesperidae) (Kerrich 1973) and cocoon of *Apanteles erionotae*, *Cotesia erionotae* (Hymenoptera: Braconidae) (Noyes 2002).

**Distributions.** Indonesia: Java; Malaysia: Sabah.

**Remarks.** Detailed description of *erionotae* has been written by Kerrich (1973). This species can be easily recognised by the combination of characters, body shining and brightly coloured, head moderately emarginate behind posterior ocelli, median band of scutellum broad, smooth and shining, propodeum and nucha very weakly emarginate at apex. Most specimens were reared from eggs of banana leaf roller *Erionota thrax*.

**Material examined.** West Java: 5♀ (MZB), Bogor, Tanah Sareal, Cimanggu, 19.iii.1996, 250 m asl, Erniwati, ex egg's *Erionota thrax*; 5♀ (MZB), Bogor, Tanah Sareal, Cimanggu, 22.x.1996, 250 m asl, Erniwati, ex egg's *Erionota thrax*; 1♀ (MZB), Bogor, Tanah Sareal, Cimanggu, 23.x.1996, 250 m asl, Erniwati, ex egg's *Erionota thrax*; 1♀ (MZB), Ciarnis, Panjalu, Panambungan, 19.vi.2005, 07°08'S 108°15'E, 800 m asl Sutrisno H & Cholik E, sweeping net.

### ***Pediobius foveolatus* (Crawford, 1912)**

*Pleurotropis foveolatus* Crawford, 1912: 1. Type species *Pleurotropis foveolatus* Crawford, 1912. Transferred to *Pediobius foveolatus* by Kerrich (1973: 163).

*Pleurotropis mediopunctata* Waterston, 1915: 345. Type species *Pleurotropis mediopunctata* Waterston, 1915. Lectotype and subsequent designation by Kerrich (1973: 163).

*Pleurotropis epilachnae* Rohwer, 1921: 126. Type species *Pleurotropis epilachnae* Rohwer, 1921. Synonymized with *Pediobius foveolatus* by Kerrich (1973: 163).

*Mestocharis lividus* Girault, 1913: 140. Type species *Mestocharis lividus* Girault, 1913. Synonymized with *Pediobius foveolatus* by Bouèek (1988: 703).

*Pleurotropis simiolus* Takahashi, 1932: 115. Type species *Pleurotropis simiolus* Takahashi, 1932. Synonymized *Pediobius foveolatus* by Paik (1991: 61).

**Host records.** *Apanteles pelops*; *Brachymeria*; *Coccinella septempunctata*; *Cotesia ruficrus*, *Nyereria mlanje* (Hymenoptera: Braconidae); *Euplectrus leonae* (Hymenoptera: Eulophidae); *Diacrisia punctulata* (Lepidoptera: Arctiidae); *Eublemma gayneri* (Lepidoptera: Noctuidae); *Pelopidas mathias* (Lepidoptera: Hesperidae); *Phycita diaphana* (Lepidoptera: Pyralidae). *Epilachna chrysomelina*; *E. dodecastigma*; *E. mexicana*; *E. obscurella*; *E. ocellata*; *E. philippinensis*; *E. similis*; *E. tredecimnotata*; *E. varivestis*; *Henosepilachna vigintioctomaculata*; *Henosepilachna vigintioctopunctata*; *Mada polluta*; *Malata delphinae*; *Menochilus sexmaculatus* (Coleoptera: Coccinellidae) (Noyes 2002).

**Plant associates.** *Anethum graveolens*; *Coriandrum sativum*; *Foeniculum vulgare* (Umbeliferae); *Momordica charantia* (Cucurbitaceae); *Glycine max*, *Phaseolus lunatus*, *Phaseolus vulgaris* (Leguminosae); *Solanum macrocarpon*; *Solanum melongena*; *Solanum tuberosum* (Solanaceae) (Noyes 2002).

**Distributions.** This species has wide range in distribution. Indonesia: Sumatra, **Java (NEW RECORD)**; U.S.A.: Florida, Indiana, Maryland, New Jersey; Mexico; Italy: Ivory Coast; Cameroon; Senegal; Mali; Nigeria; Pakistan; India: Bihar, Karnataka, Madhya Pradesh, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal; Nepal; China: Beijing, Hong Kong, Hubei, Jiangxi, Shanxi, Yunnan; Guam; USSR-Siberia; Japan; South Korea; Sri Lanka; Philippines; Australia: New South Wales, Northern Territory.

**Remarks.** This species was described by Crawford (1912) based on female collected from India, and recorded first time from Indonesia by Nakamura (1988) from the material collected from Sumatra. The additional material now recorded from Java is a new record from the island.

**Material examined.** *West Java*: 1♂, 1♀ (MZB) Bogor, Cibinong, Km.46, front of Widyasatwaloka LIPI, 6.iv.2001, Ubaidillah R, sweeping net; 3♀ (MZB), G. Salak, Calobak, 9.iv.2001, 500 m asl, Ubaidillah R, ex *Epilachna* sp.; 6♀ (MZB), Ciamis, Panjalu, Panambungan, 19.vi.2005, 07°08'S 108°15'E, 800 m asl, Sutrisno H & Cholik E, sweeping net. *Central Java*: 1♂ (MZB), Purwokerto, Baturraden, Track from Kebun Raya to Pemalang, 29.iii.2006, 800 m asl, Ubaidillah R & Darmawan, sweeping net; 3♀ (MZB), Cilacap, Nusakambangan, Sodong Limus Buntu, 31.iii.2006, 07°44'S

108°56'E, 98 m asl, Ubaidillah R & Darmawan, Sweeping net; 1♀ (MZB), Cilacap, Nusa Kambangan, track from Karang Tengah to Benteng, 01.iv.2006, 07°43'S 108°34'E, 98 m asl, Ubaidillah R & Darmawan, Sweeping net. *D.I.Yogyakarta*: 1♀ (MZB), Sleman, Pakem, Purwobinangun, Turgo Bawah, 17.vii.2005, 07°35'S 110°26'E, 920 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net; *D.I.Yogyakarta* : 1♀ (MZB), Sleman, Pakem, Purwobinangun, Turgo Atas, 25.vii.2005, 07°35'S 110°24'E, 1100 m asl, Ubaidillah R & Darmawan, sweeping net.

***Pediobius imbreus*** (Walker, 1846)

*Entedon (Pediobius) imbreus* Walker, 1846: 184. Type species *Entedon imbreus* Walker, 1846. Synonymized with *Pediobius imbreus* by Kerrich (1970: 90).

*Pleurotropis detrimentosus* Gahan, 1930: 9. Type species *Pleurotropis detrimentosus* Gahan, 1930. Synonymized with *Pediobius imbreus* by Kerrich (1970: 9).

**Host records.** *Apanteles taragamae*, *Dolichogenidea metesae*, *Bracon brevicornis* (Hymenoptera: Braconidae), *Euplectromorpha bicarinata* (Hymenoptera: Eulophidae), *Perisierola nephantidis* (Hymenoptera: Bethyliidae); Araneida; *Bessa remota* (Diptera: Tachinidae); *Cremastopsyche pendula* (Lepidoptera: Psychidae), *Epicephala chalybacma* (Lepidoptera: Gracilariidae), *Opisina arenosella* (Lepidoptera: Oecophoridae), *Pagodiella hekmeyeri* (Lepidoptera: Psychidae); Chrysomelidae; *Plesispa reichei*; *Promecothea nuciferae* (Coleoptera: Chrysomelidae) (Noyes 2002).

**Plant associates.** *Cocos nucifera*, *Elaeis guineensis* (Palmae); *Ixora pauciflora* (Rubiaceae).

**Distributions.** *Indonesia*: Java; *India*: Gujarat, Karnataka, Kerala, Maharashtra, Rajasthan, Tamil Nadu; *Australia*: Queensland.

**Remarks.** During the course of this study the specimen of this species was not found, however the species can be easily recognized by the key of Kerrich (1973: 187) in the couple of 22. The only available specimen of this species from Java was collected in Purworedjo, Central Java in 1930, collected by Paine. The species of *Pediobius imbreus* Walker is closely related to *P. parvulus* Ferrière and differs as follows: sides of upper face moderately

reticulate, eyes very weakly and sparsely hairy and scutellum having a broad and shining median band with sculpture absent or indistinct.

***Pediobius inexpectatus* Kerrich, 1973**

*Pediobius inexpectatus* Kerrich, 1973: 157. Type species *Pediobius inexpectatus* Kerrich, 1973.

**Host records.** *Melanitis constantia* (Lepidoptera: Nymphalidae), *Parnara guttata* (Lepidoptera: Hesperidae) (Noyes 2002).

**Plant associate.** *Saccharum officinarum* (Gramineae).

**Distributions.** Indonesia: **Java (NEW RECORD)**; China: Fujian, Hong Kong, Jiangxi; Papua New Guinea.

**Remarks.** The present specimens match with the original descriptions of Kerrich (1973). In more typical specimens, the body color is green to blue-green and the reticulation of vertex is very strong. Antennae blue green with bronze reflections. The coloration on the gaster is bright green to bronze at the apex, and these were not mentioned in the original description.

**Material examined.** *West Java*: 1♂ (MZB) Bogor, Cibirong, Km.46, front of Widyasatwaloka LIPI, 6.iv.2001, Ubaidillah R, sweeping net; 1♀ (MZB), T.N. Gede Pangrango, Sukabumi, Bodogol, track from Kantor Resort to Station Riset, 10.v.2005, 800 m asl, Ubaidillah R & Darmawan, sweeping net; 1♀ (MZB), Garut, Leuwipari, 13.vi.2005, 07°41'S 107°50'E 800 m asl, Ubaidillah R, sweeping net; 1♂ (MZB), Ciamis, Panjalu, Dukuh, Situ Lengkong, 18.vi.2005, 07°07'S 108°16'E, 800 m asl, Ubaidillah R, sweeping net. *Central Java*: 1♀ (MZB), Cilacap, Nusakambangan, Sodong Kali Nyamuk, 31.iii.2006, 07°45'S 108°56'E, 107 m asl, Ubaidillah R & Darmawan, sweeping net; 1♀ (MZB), Cilacap, Nusakambangan, Sodong Limus Buntu, 31.iii.2006, 07°44'S 108°56'E, 98 m asl, Ubaidillah R & Darmawan, Sweeping net; *D.I. Yogyakarta* : 2♀ (MZB), Sleman, Pakem, Purwobinangun, Turgo Atas, 24.iii.2006, 07°35'S 110°25'E, 910 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net. 1♂ (MZB), Sleman, Pakem, Purwobinangun, Turgo Bawah, 14.vii.2005, 07°35'S 110°24'E, 910 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net.

***Pediobius painei*** (Ferrière, 1933)

*Pleurotropis painei* Ferrière, 1933: 94. Type species *Pleurotropis painei* Ferrière, 1933. Transferred to *Pediobius painei* Kerrich (1973: 176).

**Host record.** Emerge from larva and pupa of *Promecotheca nuciferae* (Coleoptera: Chrysomelidae) (Noyes 2002).

**Distribution.** Known only from Java, Indonesia.

**Remarks.** *Pediobius painei* has been recorded and described from Java, Indonesia by Ferrière (1933) based on female and male reared mainly from the two coconut tree pests *Tirathaba* spp. (Lepidoptera: Pyralidae) and *Promecotecha* spp. (Coleoptera: Chrysomelidae) collected from Poerwardjo, Java as *Pleurotropis painei* Ferrière. This species is especially characterised by the scutellum, smooth in the middle and finely reticulate-striate on the sides.

***Pediobius parvulus*** (Ferrière, 1933)

*Pleurotropis parvulus* Ferrière, 1933: 94. Type species *Pleurotropis parvulus* Ferrière, 1933. Transferred to *Pediobius parvulus* by Kerrich (1973: 182).

**Host records.** *Bessa remota* (Diptera: Tachinidae); *Coelaenomenodera elaeidis*, *Gonophora taylori*, *Gonophora xanthomelana*, *Promecotheca cumingii*, *Promecotheca nuciferae*, *Promecotheca opacicollis*, *Promecotheca papuana*, *Promecotheca reichei* (Coleoptera: Chrysomelidae) (Noyes 2002).

**Plant associates.** *Cocos nucifera*, *Elaeis guineensis* (Palmae); *Ziziphus jujuba* (Rhamnaceae) (Noyes 2002).

**Distributions.** Indonesia: Java; India: Madhya Pradesh; Sri Lanka; Singapore; Malaysia; Papua New Guinea: Bismarck Archipelago; Fiji.

**Remarks.** This species was first described and recorded from Indonesia by Ferrière (1933) based on female and male collected from Poerwardjo, Java as *Pleurotropis parvulus* (Ferrière) and Kerrich (1973) transferred it to *Pediobius parvulus* (Ferrière). The species of *Pediobius parvulus* may be either primary or secondary parasite and occurred from western to eastern part of Java.



**Material examined.** *West Java*: 1♂ (MZB), Ciamis, Panjalu, Dukuh, Situ Lengkong, 18.vi.2005, 07°07'S 108°16'E, 800 m asl, Ubaidillah & Darmawan, sweeping net. *D.I. Yogyakarta*: 1♂ (MZB), Sleman, Pakem, Purwobinangun, Turgo Bawah, 14.vii.2005, 07°35'S 110°24'E, 910 m asl, Ubaidillah R, Rofik M & Darmawan, sweeping net.

***Pediobius ptychomyiae* (Ferrière, 1940)**

*Pleurotropis ptychomyiae* Ferrière, 1940: 131. Type species *Pleurotropis ptychomyiae* Ferrière, 1940. Transferred to *Pediobius ptychomyiae* by Kerrich (1973: 161).

**Host records.** *Brachymeria euplocae* (Hymenoptera: Chalcididae), *Glyptapanteles artonae* (Hymenoptera: Braconidae); *Casinaria* sp. (Hymenoptera: Ichneumonidae) *Bessa remota*, *Carcelia modicella* (Diptera: Tachinidae); *Artona catoxantha* (Lepidoptera: Zygaenidae) (Noyes 2002).

**Plant associate.** *Cocos nucifera* (Palmae).

**Remarks.** This species has been described and recorded from Indonesia and Malaysia by Ferrière (1940) based on female and male collected from East Java, Sumatra and Malaya as *Pleurotropis ptychomyiae* (Ferrière). Kerrich (1973) transferred it to *Pediobius ptychomyiae* (Ferrière).

**Distributions.** Indonesia: Sumatra, Java; Malaysia.

**Material examined.** *West Java*: 4♂ (MZB), Bogor, Cimanglid, 23.iv.1999, Erniwati, ex larva of *Casinaria* sp.; 1♂ (MZB), Ciamis, Panjalu, Garahang, Situ Ciater, 16.vi.2005, 07°09'S 108°15'E, 800 m asl, Sutrisno H & Cholik E, sweeping net; 1♀ (MZB), Ciamis, Panjalu, Panambungan, 19.vi.2005, 07°08'S 108°15'E, 800 m asl Sutrisno H & Cholik E, sweeping net.

***Pediobius thoracicus* (Zehntner, 1898)**

*Pleurotropis thoracica* Zehntner, 1898: 11. Type species *Pleurotropis thoracica* Zehntner, 1898. Transferred to *Pediobius thoracicus* by Kerrich (1973: 161).

**Host record.** *Cosmopteryx pallyfasciella* (Lepidoptera: Cosmopterygidae) (Kerrich, 1973).

**Distribution.** Known only from Java, Indonesia.

**Remarks.** This species was first reported from Java by Zehntner (1898) in his description of *Pleurotropis thoracica* Zehntner, based on material reared as a secondary parasite of *Cosmopteryx pallyfasciella* Snellen, a leaf mining in sugar. According to Kerrich (1973) the type material is almost certainly lost, and the description and figures, based on the male sex only.

### *Pediobius viridifrons* (Motschulsky, 1863)

*Cirrospilus viridifrons* Motschulsky, 1863: 1. Type species *Cirrospilus viridifrons* Motschulsky, 1863. Synonymized with *Pediobius viridifrons* by Bouèek (1965: 553).

**Host record.** unknown.

**Distributions.** Indonesia: **Java (NEW RECORD)**; China: Guangxi (Zhu & Huang 2002); Sri Lanka.

**Remarks.** The species of *Pediobius viridifrons* differs from *Aspidomorphae* by the head from above is outstanding, propodeum having submedian carina coalesced at base. So far, the host of *Pediobius viridifrons* has not been known.

**Material examined.** *West Java*: 1 ♀ (MZB), Ciamis, Panjalu, Garahang, Situ Ciater, 16.vi.2005, 07°09'S 108°15'E, 800 m asl, Ubaidillah R & Darmawan, Sweeping net; 1 ♂ (MZB), Ciamis, Panjalu, Dukuh, Situ Lengkong, 18.vi.2005, 07°09'S 108°16'E, 800 m asl, Sutrisno H & Cholik E, sweeping net. *Central Java*: 1 ♂ (MZB), Cilacap, Nusa Kambangan, track from Karang Tengah to Benteng, 01.iv.2006, 07°43'S 108°34'E, 98 m asl, Ubaidillah R & Darmawan, sweeping net.

## DISCUSSION

The genus *Pediobius* Walker contains worldwide parasitic wasps, previously only nine species recorded from Java, and the Javanese species was first described by Zehntner (1898) under the name of *Pleurotropis thoracica* Zehntner. Kerrich (1973) intensively studied the tropical and subtropical species of the genus, unfortunately he had very limited materials

from Java and more over he acquired them from several institutions in the world.

In this paper, we found almost double the known species in this genus, and extended the known distribution within Java Island. Additionally, intensive collecting in Java by the project of “*Taxa Terpilih –DIPA LIPI*” has turned up five new records from Java and also found many locality records from the arid climate of the eastern region of Java. The wasps are easily overlooked by entomologists because of their small size. However this genus is very interesting because their members are parasitoids in other insects and they are frequently involved in biological control programs directed against insects in 4 orders (mainly to Coleoptera, Diptera, Hymenoptera and Lepidoptera,). Many *Pediobius* species have been considered economically important; for example, among the species recognized in Java, *Pediobius foveolatus*, that is parasitic on Mexican bean beetle (*Epilachna varivestis* Mulsant), has been successfully introduced into several countries for this purpose (Holko 2006, Vargo & Schreiner 2000, Schaefer *et al.* 1986). LaSalle (1993) suggested that parasitic Hymenoptera including the Eulophidae are the most important groups in biological control and can be applied to biological control programs in any crop system. Unfortunately, the knowledge to understand the species diversity of natural enemies of pests of crops as well as the methods to increase their population sizes to enhance biological control programs in Java and Bali is still in infancy. However, continuing efforts in studying the parasitic wasps would contribute to the reduction of pesticide use.

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