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# CICADA FAUNA (HOMOPTERA: CICADOIDAE) OF CROCKER RANGE PARK AND KINABALU PARK, SABAH

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## ABSTRACT

A total of 24 cicada species in 12 genera and 2 families (Cicadidae, 22 species in 10 genera; Tibicinidae, 2 species in 2 genera) were recorded for Sabah Parks conservation areas. This was based on specimens collected through 9 sampling days from 5 sectors namely Inobong and Mahua of Crocker Range Park; Sayap, Poring and Kinabalu Park Head Quarters of Kinabalu Park; conducted in March (13 – 23), 2005. This survey has discover four possible new pecies i.e. *Chremistica* sp., *Puranoides* sp1., *Puranoides* sp2. and *Muda* sp., since morphologically they differ from all thus-far known cicada species. Of the total, four species are new records for Crocker Range Park i.e. *Chremistica pontianaka* (Distant), *Chremistica borneensis* Salmah & Duffels, *Dundubia euterpe* Bloem and Duffels, and *Nelcyndana tener* (Stål), while *Maua albigutta* (Walker) is the only new record for Kinabalu Park. Result of this survey has increased the record of cicada fauna for Crocker Range Park and Kinabalu Park from 29

and 45 species to 36 and 48 species respectively. Manifestation of cicada species richness and composition was better in Crocker Range Park (represented by 20 cicada species in 11 genera) compared to Kinabalu Park (11 species in 8 genera). Of the total 24 species, 13 and 4 species were only recorded in Crocker Range Park and Kinabalu Park respectively. Spatially and Temporally, *Dundubia vaginata* (Fabricius) remained the most common species for the parks (recorded in 7 over 9 sampling days, from all sectors) and appeared as the most abundant species, followed by *Platylomia viridimaculata* (Distant) and *Orientopsaltria ida* (Moulton).

**Key words**: Cicadoidea, Cicada, species list, Crocker Range Park, Kinabalu Park.

## ABSTRAK

Sejumlah 24 spesies riang-riang dalam 12 genus dan 2 famili (Cicadidae, 22 spesies dalam 10 genus; Tibicinidae, 2 spesies dalam 2 genus) telah direkodkan bagi kawasan konservasi Taman-taman Sabah. Ini adalah berdasarkan spesimen yang dikumpul melalui 9 hari persampelan daripada 5 sektor iaitu Inobong dan Mahua di Taman Banjaran Crocker; Sayap, Poring dan Ibu Pejabat Taman Kinabalu di Taman Kinabalu; yang telah dijalankan pada 13 – 23, Mac 2005. Tinjauan ini telah menemukan empat spesies yang berkemungkinan sebagai spesises baru iaitu *Chremistica* sp., *Puranoides* sp1., *Puranoides* sp2. dan *Muda* sp., kerana berbeza secara morfologi daripada semua spesies riang-riang yang telah diketahui sehingga kini. Daripada jumlah spesies yang diperolehi, empat spesies merupakan rekod baru bagi Taman Banjaran Crocker iaitu *Chremistica pontianaka* (Distant), *Chremistica borneensis* Salmah & Duffels, *Dundubia euterpe* Bloem dan Duffels, dan *Nelcyndana tener* (Stål), manakala *Maua albigutta* (Walker) adalah satu-satunya rekod baru bagi Taman Kinabalu. Hasil tinjauan ini telah meningkatkan rekod fauna riang-riang bagi Taman Banjaran Crocker dan Taman Kinabalu, masing-masing daripada 29 dan 45 spesies kepada 36 dan 48 spesies. Manifestasi kekayaan dan komposisi spesies riang-riang adalah lebih baik di

Taman Banjaran Crocker (diwakili oleh 20 spesies dalan 11 genus) berbanding Taman Kinabalu (11 spesies dalam 8 genus). Daripada 24 spesies tersebut, 13 dan 4 spesies, masing-masing hanya direkodkan di Taman Banjaran Crocker dan Taman Kinabalu. Secara spatial dan temporal, *Dundubia vaginata* (Fabricius) kekal sebagai spesies yang paling umum bagi kedua-dua taman (direkodkan dalam 7 daripada 9 hari persampelan, daripada semua sektor) dan kelihatan sebagai spesies yang paling melimpah, diikuti oleh *Platylomia viridimaculata* (Distant) dan *Orientopsaltria ida* (Moulton).

**Kata kunci**: Cicadoidea, Riang-riang, senarai spesies, Crocker Range Park, Kinabalu Park.

## INTRODUCTION

Crocker Range Park and Kinabalu Park are two conservation areas under the jurisdiction of Sabah Parks, lying within the long mountain range of Sabah, namely Crocker Range. Crocker Range Park located in the southern sector (Tambunan-Kimanis-Keningau-Tenom) while Kinabalu Park located in the northern sector (Kota Belud-Ranau), of the mountain range (Zaidi et al. 2004).

Information on cicadas of these two areas from previous publications have been compiled by Zaidi and Azman (2003) and Zaidi et. al. (2004), including latest data in their further survey and overviews. A total of 29 cicada species (under 13 genera and 2 families) and 45 species (under 18 genera and 2 families) have been recorded for Crocker Range Park and Kinabalu Park, respectively.

In March 13 – 23, 2005, the Natural History Museum, Department of Museums Malaysia with collaboration of Sabah Parks and Centre for Insect Systematics, Universiti Kebangsaan Malaysia had conduct a scientific expedition to Crocker Range Park and Kinabalu Park. A nine days expedition was carried out in five sectors (substations) namely, Ulu Inobong, Penampang (Alt: 516-522 m, N 05° 51.39', E 116° 8.24'); Mahua, Tambunan (Alt: 1075 m, N 05° 47.913', E 116° 24.541'); Poring Hot Spring,

Ranau (Alt: 500m, N 06° 02.926', E 116° 42.036'); Sayap, Kota Belud (Alt: 948-956 m, N 06° 09.844', E 116° 33.921') and Kinabalu Park HQ (Alt: 1884-1906 m, N 06° 01.806', E 116° 32.821'). The main objective of this study is to intensify the collections of Natural History Museum, Department of Museums Malaysia besides obtaining latest cicada data at both parks. The result obtained and hereby presented, provide a further insight of the cicada fauna of Crocker Range and Kinabalu Park.

## MATERIALS AND METHOD

Night-time collections of cicada specimens were carried out. Cicadas that attracted to the light traps (with 160 watt mercury vapour bulb run by 500 watt portable generator) were then collected by hand and/or nets. Day-time collections of cicadas from shrubs were also carried out. Unfortunately, the day-time collections were not successful in getting cicadas. Only one specimen was found; *Platypleura kaempferi*. Identification and species naming of the cicada specimens were carried out based on keys given by Moulton (1923) and other references (Overmeer & Duffels, 1967; Duffels 1968, 1976, 1991, 2004; Duffels & Zaidi 1999, Kos &Gogala 2000; Azman & Zaidi 2002; Schouten & Duffels 2002, Yaacob et al 2005) and also counter-checked with identified specimens in the Centre for Insect Systematics Universiti Kebangsaan Malaysia, Bangi. The cicada specimens from this study are presently kept in the Natural History Museum, Department of Museums Malaysia.

## RESULTS AND DISCUSSIONS

### Cicada fauna of Crocker Range Park and Kinabalu Park

The cicada fauna for Crocker Range Park and Kinabalu Park, presented below in the form of species checklist (Appendix 1) and summary table (Table 1). As shown in Table 1, a total of 215 specimens representing 24 cicada species in 12 genera and 2 families (Cicadidae, 22 species in 10 genera; Tibicinidae, 2 species in 2 genera) were recorded for Sabah Parks conservation areas. This was based on specimens collected through 9 sampling days

from 5 sectors namely Inobong and Mahua of Crocker Range Park; Sayap Poring and Kinabalu Park Head Quarters of Kinabalu Park; conducted in March (13 – 23), 2005.

Four species obtained during this survey, currently named as *Chremistica* sp., *Puranoides* sp1., *Puranoides* sp2. and *Muda* sp. are possibly new species, since morphologically they differ from all thus-far known cicada species. *Chremistica pontianaka* (Distant), *Chremistica borneensis* Salmah & Duffels, *Dundubia euterpe* Bloem and Duffels, and *Nelcyndana tener* (Stål) obtained during this survey are new records for Crocker Range Park, while *Maua albigutta* (Walker) is the only new record for Kinabalu Park. Of the total 24 species, 13 and 4 species were only recorded in Crocker Range Park and Kinabalu Park, respectively. The discovery of possible new species and new records species has increased the record of cicada fauna for Crocker Range Park and Kinabalu Park from 29 and 45 species to 36 and 48 species, respectively.

**Species richness, composition, commonness and abundance**

Manifestation of cicada species richness and composition within Crocker Range Park of 20 species in 11 genera under 2 families (Cicadidae, 18 species in 9 genera; Tibicinidae, 2 species in 2 genera) from two sectors (Inobong and Mahua) appears better than Kinabalu Park of 11 species in 8 genera under 2 families (Cicadidae 10 species in 7 genera; Tibicinidae, 1 species in 1 genus) from three sectors (Sayap, Poring and Kinabalu Park HQ). The species richness and composition within Inobong sector of 15 species in 7 genera appears the highest (Table 1). This is followed by Sayap (9 species in 7 genera), Mahua (7 species in 7 genera), Kinabalu Park HQ (5 species in 5 genera) and Poring (only 1 species).

Table 1 also shows that, spatially, *Dundubia vaginata* (Fabricius) appears to be the most common species (found in all sectors), replacing *Platylomia spinosa* (Fabricius) as reported by Zaidi and Nordin (2001) and Zaidi et al. (2004). This is followed by *Muda* sp. that was found in 4 sectors. Temporally, *D. vaginata* (found in 7 out of 9 sampling days), remains the most common species as previously reported (Zaidi & Nordin 2001; Zaidi et al.

2004). This is followed by *Muda* sp, *Platylomia viridimaculata* (Distant) and *Orientopsaltria ida* (Moulton). As a whole, *D. vaginata* appears as the most abundant species representing 42.67% of the total specimen obtained. This is followed by *P. viridimaculata*, *O. ida* and *Pomponia lactea* (Distant), representing 17.33, 5.78 and 4.89%, respectively.

## CONCLUDING REMARKS

In view of the above result and previous publications (Zaidi & Nordin, 2001; Zaidi et al. 2004), more regular surveys conducted over a longer duration and covering more sectors would provide a better representation of the cicada fauna of the parks. The discovery of possible new species and new records shows that the current species checklist had extended just in a short period of survey during a good season, especially for Crocker Range Park. Such study should be continued over a longer period, which may likely produce better extension of cicada faunal checklist.

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**Table 1:** Checklist of cicada fauna obtained from Crocker Range Park and Kinabalu Park during expedition (♀:♂).

| NO. | TAXA | Localities (13 - 23 /03 /05) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Crocker Range Park | | | | | Kinabalu Park | | | | |
| | | Inobong | | Mahua | | | Sayap | | Poring | Park HQ | |
| TOTAL | | | | | | | | | | | |
| | | 14/3 | 15/3 | 16/3 | 17/3 | 18/3 | 19/3 | 20/3 | 20/3 | 21/3 | |
| | **Cicadidae** | | | | | | | | | | |
| 1 | *Patypleura kaempferi* (Fabricius) | - | - | 1:0 | - | - | - | - | - | - | 1:0 |
| 2 | *Tacua speciosa* (Illeger) | - | 1:0 | - | - | - | 1:0 | - | - | - | 2:0 |
| 3 | *Chremistica pontianaka* (Distant) # | - | 3:0 | - | - | - | - | - | - | - | 3:0 |
| 4 | *Chremistica borneensis* Salmah & Duffels # | - | 1:0 | - | - | - | - | - | - | - | 1:0 |
| 5 | *Chremistica* sp. ◆... | - | 1:0 | - | - | - | - | - | - | - | 1:0 |
| 6 | *Cryptotympana praeclara* Hayashi | - | 2:0 | - | - | - | - | - | - | - | 2:0 |
| 7 | *Maua albigutta* (Walker) ● | - | - | - | - | - | 0:1 | - | - | - | 0:1 |
| 8 | *Dundubia euterpe* Bloem & Duffels # | - | 4:2 | - | - | 1:0 | - | - | - | - | 5:2 |
| 9 | *Dundubia rufivena* (Walker) | - | 1:2 | - | - | - | - | - | - | - | 1:2 |
| 10 | *Dundubia vaginata* (Fabricius) | 33:6 | 39:4 | 1:0 | | 0:1 | | 2:0 | 4:1 | 5:0 | 84:12 |
| 11 | *Orientopsaltria agatha* (Moulton) | - | 1:0 | - | - | - | - | - | - | - | 1:0 |
| 12 | *Orientopsaltria alticola* (Distant) | 0:1 | - | - | - | - | - | - | - | - | 0:1 |
| 13 | *Orientopsaltria ida* (Moulton) | - | - | 2:7 | 0:1 | 0:2 | 1:0 | - | - | - | 3:10 |
| 14 | *Orientopsaltria kinabaluana* Duffels& Zaidi | - | - | - | - | - | - | - | 2:0 | 1:0 | 3:0 |
| 15 | *Orientopsaltria montivaga* (Distant) | 2:0 | 5:0 | - | - | - | - | - | - | - | 7:0 |

*Table 1 continue...*

*Table 1 continued...*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | *Platylomia spinosa* (Fabricius) | 2:0 | 1:0 | - | - | - | - | - | - | - | 3:0 |
| 17 | *Platylomia viridimaculata* (Distant) | 23:0 | 14:0 | - | - | - | - | - | 1:0 | 1:0 | 39:0 |
| 18 | *Puranoides* sp1 ◆... | - | - | 1:2 | 0:2 | - | - | - | - | - | 1:4 |
| 19 | *Puranoidses* sp2 ◆... | - | - | - | - | 0:1 | 1:1 | - | - | - | 1:2 |
| 20 | *Pomponia graecina* Distant | - | - | - | - | - | 1:0 | - | 1:0 | - | 2:0 |
| 21 | *Pomponia lactea* (Distant) | - | - | 5:3 | - | 0:1 | 0:2 | - | - | - | 5:6 |
| 22 | *Pompania merula* Distant | 2:0 | - | - | - | - | - | - | - | - | 2:0 |
| | **Tibicinidae** | | | | | | | | | | |
| 23 | *Nelcyndana tener* (Stal) # | - | - | 1:0 | - | - | - | - | - | - | 1:0 |
| 24 | *Muda* sp ◆...# | - | 0:1 | 1:1 | - | 0:1 | 1:1 | - | 0:1 | - | 2:5 |
| | **Total no. of specimens** | **62:7** | **73:9** | **12:13** | **0:3** | **1:6** | **5:5** | **2:0** | **8:2** | **7:0** | **170:45** |
| | **Total no. of species (genera)** | **15(7)** | | **7(7)** | | **9(7)** | | **1(1)** | | **5(5)** | **24(12)** |
| | | **20(11)** | | | | | | | **11(8)** | | |

**Legend:** ◆…possible new species; # new record for Crocker Range Park; ● new record for Kinabalu Park;

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**Appendix 1: Cicada specimens obtained during the expedition in Crocker Range Park and Kinabalu Park, Sabah.**

### 1. *Platypleura kaempferi* (Fabricius)

*Tettigonia kaempferi* Fabricius, 1794, Entomologia Systematica emendate et aucta, IV, Ryngota,p.23 (Japan).
*Cicada kaemferi*: Germar, 1830, Entom. Archiv. II (2) p. 2 (Japan)
*Platypleura kaempferi*: Butler, 1874, Cistula Entomologica, VIII,p.189. – Distant, 1889, Monograph Oriental Cicadidae, 1&2,p.20 (China, Japan, Sarawak). – Moulton, 1923, J. Fed. Mal. St. Mus. 11:141 (Japan, China, Malay Peninsula, Borneo). – Zaidi & Nordin, 2001, Serangga 6(1):181 (as *Platypleura* sp.) (Sabah: Crocker Range Park). – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 191, 195 (Sabah: Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Tambunan, Mahua, Alt:1075m, 16.iii.2005, Aida, Tun, Azman, Sinail, 1 male.

### 2. *Tacua speciosa* (Illeger)

*Tettigonia speciosa* Illinger, 1800, Weid. Zool. Arch., 2:145. – Fabricius, 1803, Systema Rhyngotorum;145 (Sumatra).
*Tacua speciosa*: Amyot & Serville, 1843, Hist. Nat. Insc., Hemipt.: 462 (Java). – Moulton, 1923, J. Fed. Mal. St. Mus. 11:138 (Malay Peninsula; Sumatra; Java). - Zaidi & Nordin, 2001, Serangga 6(1):183 (Sabah: Crocker Range Park). – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 191, 195 (Sabah: Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Aida, Tun, Azman, Senail, 1 male; Sayap, Alt:948-956m, 19.iii.2005, Aida, Tun, Azman, Sinail, 1 male.

### 3. *Chremistica pontianaka* (Distant)

*Cicada pontianaka* Distant, 1888, Ann. Mag. Nat. His., 6(1):298 [W.Borneo (type, male)]. - Distant, 1892, Oriental Cicad., 5-7:97 [Malay Peninsula; Sumatra (type, male); Java, Borneo, Sulu].

*Rihana pontianaka*: Distant, 1906, Cat. Homoptera, 1:33 (Malaya). - Moulton, 1923, J. Fed. Mal. St. Mus., 11:130 [Malay Peninsula; Borneo; Banguey; Sumatra (male); Java; Sulu Islands; Philipines; New Guinea ].

*Chremistica pontianaka*: Kirkaldy, 1907, Ann. Soc. Ent. Belg.ique, 51:305 (Malay Peninsula; Sumatra; Java; Borneo; Sulu). - Bregman, 1985, Beufortia, 35(4):39 (S.E.Asia). - Zaidi & Hamid, 1996, Serangga 1(1):53 [Sarawak (males)] . - Zaidi & Ruslan, 1997, Serangga 2(2):220 [Peninsular Malaysia (male, female); Singapore (females, NUS)]. - Zaidi & Ruslan, 1998a, Serangga 3(2):347 [Sarawak (males & females)]. – Zaidi et al. 1999, Serangga, 4(2):302 [Sabah (females)]. – Zaidi et al., 2001, Serangga 6(1):117, (Langkawi). – Salmah & Zaidi, 2002, Serangga, 7(1-2):227 [Peninsular Malaysia (males, females)]. – Zaidi & Azman, 2003, Serangga, 8(1-2):104, (Sabah). – Azman et al., 2005, Hutan Simpan Ulu Muda, Kedah: 157, 158 (Kedah).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Pete, Ali, T.Wan, Johnny, 2 males; 15.iii.2005, Aida, Tun, Azman, Sinail, 1male.
Remarks: This is a new record for Crocker Range Park.

### 4. *Chremistica borneensis* Salmah & Duffels

*Chremistica borneensis* Salmah & Duffels, 2005, Tijdschrift voor Entom. 148(2):250, 291.

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Pete, Ali, T.Wan, Johnny,1 male.
Remarks: This is a new record for Crocker Range Park.

### 5. *Chremistica* sp.

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male. Remarks: The identity needs further confirmation to be described as new species.

### 6. *Cryptotympana praeclara* Hayashi

*Cryptotympana praeclara* Hayashi, 1987, Bull. Kitakyushu Mus. Nat. Hist., 6:182 [Borneo, Sarawak, Marudi (type, male); Sabah, Mt. Kinabalu, HQ, Crocker Range (1400m), Keningau; East-Borneo, Sangasangadalem; Brunei, Seria; E. Kalimantan, Keburao. – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 191, 195 (Sabah: Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Aida, Tun, Azman, Sinail 2 males.

### 7. *Maua albigutta* (Walker)

*Dundubia albigutta* Walker, 1856, Journ. & Proc. Linn. Soc. Lond. Zool. 1:83 [Sumatra (type, male)].

*Leptopsaltria albiguttata*: Distant, 1889, Orient. Cicad., 2: 36 (Malay Peninsula, Sumatra, Java).

*Maua albiguttata*: Distant, 1906, Cat. Homop. 1:52 (Malaya). – Moulton, 1910, Journ. Straits Branch, 57:133 (Borneo). – Distant, 1912, Gen. Insec. 142:41 (Malaya).

*Purana albigutta*: Metcalf, 1963, Cat. Homop. Cicad 1: 463. – Zaidi & Ruslan, 1997, Serangga, 2(2): 221 (Siangapore). – Zaidi et al., 2001, Serangga 6(1): 118 (Peninsular Malaysia). – Zaidi et al., 2001, Serangga, 6(2): 314.

*Maua albigutta*: Moulton, 1923, J. Fed. Mal. St. Mus., 11:125 (Malay Peninsular, Java, Borneo, China Philippines. – Zaidi & Azman, 2003, Serangga, 8(1-2): 104 (Sabah). – Azman & Zaidi, 2005, Taman Negeri Gunung Stong Kelantan, 133, 139 (Kelantan).

Materials examined: MALAYSIA, Sabah, Sayap, Alt:948-956m, 19.iii.2005. Pete, Ali, T.Wan, Johnny, 1 male.
Remarks: This is a new record for Kinabalu Park.

### 8. *Dundubia euterpe* Bloem & Duffels

*Dundubia euterpe* Bloem & Duffels, 1976, Bull. Zool. Mus. 5:147 [Peninsular Malaysia, Perak (male, type)]. – Zaidi et al. 1996, Serangga 1(1): 60 [Peninsular Malaysia (males, females)]. – Zaidi et al., 1999b, Serangga 4(2):307 [Sabah (males)]. – Zaidi et al., 2000, Serangga 5(1):198 [Sabah (males, females)]. – Zaidi et al., 2001, Serangga 6(1):125 (Sarawak). – Zaidi & Azman, 2003, Serangga, 8(1-2):104, (Sabah). – Azman et al., 2005, Hutan Simpan Ulu Muda, Kedah: 157, 158 (Kedah).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Aida, Tun, Azman, Sinail, 3 males, 1 female; 15.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male, 1 female; Sayap, Alt:948-956m, 18.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male.
Remarks: This is a new record for Crocker Range Park.

### 9. *Dundubia rufivena* (Walker)

*Dundubia rufivena* Walker, 1850, List Hom., 1:59 [Java (type, male)]. - Moulton, 1923, J. Fed. Mal. St. Mus., 11:84 [New Guinea, Krakatau, Verlaten, Sebesi ; Nias & Mentawei ; Amboina; Java; Sumatra, Borneo; Southern Siam; Malay Peninsula]. - Overmeer & Duffels, 1967, Beufortia 14(166):47 [Java; Borneo; Celebes; Sumatra; Peninsular Malaysia; Siam; Singapore]. - Zaidi & Ruslan, 1995a, Sayap-Kinabalu Park, Sabah:219 [Sabah (male & females)]. - Zaidi & Ruslan, 1995b, Tawau Hills Park, Sabah:200 [Sabah (female)]. - Zaidi *et al*., 1996, Serangga 1(1):60 [Peninsular Malaysia (males & females)]. - Zaidi & Hamid, 1996, Serangga 1(1):53 [Sarawak (females)]. - Zaidi & Ruslan, 1997, Serangga 2(2): 224 (Indonesia, Bantam Island (male, females); Singapore

(male); Peninsular Malaysia (females)]. – Zaidi *et al.,* 2000. Serangga 5(1):206(Sabah). – Zaidi et al., 2001, Kep. Bio. Peng. T.N. Perlis: 149 (Perlis). – Zaidi & Azman, 2003, Serangga, 8(1-2):105, (Sabah). – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 191, 195 (Sabah: Crocker Range Park). – Azman et al., 2005, Hutan Simpan Ulu Muda, Kedah: 157, 158 (Kedah).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Aida, Tun, Azman, Senail, 1 male, 2 females.

### 10. *Dundubia vaginata* (Fabricus)

*Tettigonia vaginata* Fabricius, 1787, Mant. Insect., Rynchota, 2:266 [Sumatra (type, male)].

*Dundubia vaginata*: Amyot & Serville, 1843, Hist. Nat. Ins. Hemip.: 471. - Moulton, 1923, J. Fed. Mal. St. Mus., 11:83 (North Australia, China; India; Java; Sumatra; Borneo, Sarawak; Malay Peninsula). - Overmeer & Duffels, 1967, Beufortia 14(166):34 [Sumatra; Java; Borneo; Peninsular Malaysia; Hongkong; Tenasserim]. - Zaidi & Ruslan, 1995a, Sayap-Kinabalu Park, Sabah:219 [Sabah (males & females)]. - Zaidi & Ruslan, 1995b, Tawau Hills Park, Sabah:200 [Sabah (male & female)]. - Zaidi *et al*., 1996, Serangga 1(1):60 [Peninsular Malaysia (males & females)]. - Zaidi & Hamid, 1996,

Serangga 1(1):53 [Sarawak (males)]. – Zaidi & Ruslan, 1997, Serangga 2(2):225 [Brunei (males); Peninsular Malaysia (males & female)]. – Zaidi et al., 2001, Kep. Bio. Peng. T.N. Perlis: 149 (Perlis). – Zaidi & Azman, 2003, Serangga, 8(1-2):105, (Sabah). – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 191, 195 (Sabah: Crocker Range Park). – Azman et al., 2005, Hutan Simpan Ulu Muda, Kedah: 157, 158 (Kedah).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 14.iii.2005, Aida, Tun, Azman, Sinail, 11

males, 4 females; 14.iii.2005, Pete, Ali, T.Wan, Johnny, 22 males, 2 females; 15.iii.2005, Aida, Tun, Azman, Sinail, 17 males; 15.iii.2005, Pete, Ali, T.Wan, Johnny, 22 males, 4 females; Sayap, Alt:948-956m, 18.iii.2005, Aida, Tun, Azman, Sinail, 1 female; Kinabalu Park, Alt1602m, 20.iii.2005, Aida, Tun, Azman, Sinail, 2 males, 20.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male, 2 females; Kinabalu Park, Timpohon Shelter, 1884-1906m, 21.iii.2005, Aida, Tun, Azman, Sinail, 3 males; 21.iii.2005, Pete, Ali, T.Wan, Johnny, 2 males; Poring, Alt:500m, 20.iii.2005, Aida, Tun, Azman, Sinail 1 male; 20.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male.

### 11. *Orientopsaltria agatha* (Moulton)

*Cosmopsaltria agatha* Moulton, 1911, J. Str. Branc. Roy. Asiat. Soc. 57:187 [Sarawak (type, male)]. - Moulton, 1923, J. Fed. Mal. St. Mus., 11:95 (Sarawak).

*Orientopsaltria agatha:* Duffels, 1968, Beaufortia, 15(190):83 [Sarawak (males)]. - Duffels & Zaidi, 1999, Tijdscrift voor Entomologie 142(2):225 [Borneo (Sabah, Sarawak, Brunei, Kalimantan)]. – Zaidi & Nordin, 2001, Serangga, 6(1):190 (Crooker Range Park). – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 191, 195 (Sabah: Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male.

### 12. *Orientopsaltria alticola* (Distant)

*Cosmosaltria alticola* Distant, 1905, Trans. Ent. Soc. London.:200 [North Borneo, Mt. Kinabalu (type, male)]. - Moulton, 1923, J. Fed. Mal. St. Mus., 11:91 (Borneo, Sarawak).

*Orientopsaltria alticola*: Duffels, 1983, Pac. Ins. Mon., 39:9. - Duffels & Zaidi, 1999, Tijdscrift voor Entomologie 142(2):265 [Borneo (Sabah, Sarawak, Brunei, Kalimantan); Peninsular Malaysia (Pahang)]. – Zaidi & Nordin, 2001, Serangga, 6(1):181 (Sabah: Crocker Range Park) – Zaidi *et*

*al.,* 2004, Crocker Range Scientific Expedition 2002: 197 (Sabah: Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 14.iii.2005, Pete, Ali, T.Wan, Johnny, 1 female.

### 13. *Orientopsaltria ida* (Moulton)

*Cosmopsaltria ida* Moulton, 1911, J. Str. Branc. Roy. Asiat. Soc. 57:139 [Sarawak (type, male). – Moulton,1923, J. Fed. Mal. St. Mus., 11:91 (Sarawak, Kedurung).

*Orientopsaltria ida* : Duffels, 1983, Pac. Insec. Monogr. 39:9. – Duffels & Zaidi, 1999, Tijdscrift voor Entomologie 142(2):310 [Borneo (Sabah, Sarawak, Brunei, Kalimantan)]. – Zaidi & Nordin, 2001, Serangga, 6(1):181 (Crocker Range Park). – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 191, 195 (Sabah: Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Tambunan, Mahua, Alt:1075m, 16.iii.2005, Aida, Tun, Azman, Sinail, 1 male, 3 females; 16.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male, 4 females; 17.iii.2005, Aida, Tun, Azman, Senail, 1 female; Sayap, Alt:948-956m, 18.iii.2005, Aida, Tun, Azman, Sinail, 1 female; 18.iii.2005, Pete, Ali, T.Wan, Johnny, 1 female, 19. iii. 2005, Pete, Ali, T.Wan, Johnny 1 male.

### 14. *Orientopsaltria kinabaluana* Duffels & Zaidi

*Orientopsaltria kinabaluana* Duffels & Zaidi, 1999, Tijdschrift Voor Entomologie, 142: 200, 261 (Sabah). – Zaidi & Azman, 2003, Serangga, 8(1-2): 97, 105 (Sabah).

Materials examined: MALAYSIA, Sabah, Kinabalu Park,1602m, 20.iii.2005, Aida, Tun, Azman, Sinail, 1 male; 20.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male; 21.iii.2005, Aida, Tun, Azman, Sinail, 1 male.

### 15. *Orientopsaltria montivaga* (Distant)

*Cosmopsaltria montivaga* Distant, 1889, Ann. Mag. Nat. Hist., 6(3):421 [North Borneo, Mt.Kinabalu (type, male)]. - Moulton, 1923, J. fed. Mal. St. Mus., 11:95 [Sumatra, Medan; Borneo, Mt. Kinabalu, Sarawak; Malay Peninsula].

*Orientopsaltria montivaga*: Kato, 1944, Bull, Cicadidae Mus., 14:10. - Duffels, 1968, Beaufortia, 15(190):81 [North Borneo, Mt. Kinabalu (males); Sumatra (males)]. - Zaidi & Ruslan, 1995b, Tawau Hills Park, Sabah:200 [Sabah (males)]. - Duffels & Zaidi, 1999, Tijdscrift voor Entomologie 142(2):219 [Borneo, (Sabah, Sarawak, Brunei, Kalimantan)]. – Zaidi & Nordin, 2001, Serangga, 6(1):181 (Crocker Range Park). – Zaidi et al, 2004, Crocker Range Scientific Expedition 2002: 200 (Sabah, Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 14.iii.2005, Aida, Tun, Azman, Sinail, 1 male ; 14.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male; 15.iii.2005, Aida, Tun, Azman, Sinail, 2 males; 15.iii.2005, Pete, Ali, T.Wan, Johnny, 3 males.

### 16. *Platylomia spinosa* (Fabricus)

*Tettigonia spinosa* Fabricius, 1787, Mant. Insect. Rhynchota, 2:266 [Sumatra (type, male)].

*Cosmopsaltria spinosa*: Stal, 1866, Berl. Ent. Zeit. 10:171. – Distant, 1890, Orient. Cicad., 3:52 (Malay Peninsula; Borneo; Sumatra; Philippines).

*Platylomia spinosa*: Distant, 1906, Cat. Hom. Cicad., 1:58 [Philippines, Borneo, Sumatra, Malay Peninsula]. – Moulton, 1923, J. Fed. Mal. St. Mus., 11:98 [New Guinea (males); Philippines; Sumatra; Borneo, Sarawak; Malay Peninsula, Singapore]. – Zaidi & Ruslan, 1994, Kesatuan dalam Kepelbagaian Penyelidikan Biologi:426 (Peninsular Malaysia: Bukit Fraser). – Zaidi & Ruslan, 1995, Sayap-Kinabalu Park, Sabah :219 [Sabah (male & females)]. – Zaidi & Hamid, 1996, Serangga 1(1):53 (Sarawak). – Zaidi et al., 1996,

Serangga 1(1):61 (Peninsular Malaysia). – Zaidi, 1996, Serangga 1(2):101 (Sarawak). – Zaidi & Ruslan, 1997, Serangga 2(2):227 (Singapore; Peninsular Malaysia). – Zaidi & Ruslan, 1998; Serangga 3(2): 361 (Sarawak). – Beuk, 1999, Oriental Insects 33:12 (Thailand; Peninsular Malaysia; East Malaysia, Sabah, Sarawak; Brunei Indonesia, Sumatra, Java). – Zaidi et al., 1999, Serangga 4(2):312 (Sabah). – Zaidi et al. 2000, Serangga 5(1):211 (Sabah). – Zaidi *et al*., 2001, Kep. Bio. Peng. T. N. Perlis: 149 (Perlis). Azman & Zaidi, 2004, Taman Negeri Endau Rompin: 175 (Pahang). – Zaidi et al, 2004, Crocker Range Scientific Expedition 2002: 200 (Sabah, Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 14.iii.2005, Pete, Ali, T.Wan, Johnny, 2 males; 15.iii.2005, Aida, Tun, Azman, Sinail, 1 male.

### 17. *Platylomia viridimaculata* (Distant)

*Pomponia viridimaculata* Distant, 1889, Ann. Mag. Nat. Hist. 3:419 [North Borneo (type, male)].

*Champaka viridimaculata*: Moulton, 1923, J. Fed. Mal. St. Mus., 11:116 (Borneo). - Zaidi et al., Serangga 1(1): 60 [Peninsular Malaysia (male)]. - Zaidi & Hamid, 1996 1(1):53 [Sarawak (males)].

*Platylomia viridimaculata*: Beuk, 1999, Oriental Insects, 33:32 [Peninsular Malaysia (male), Sabah (males & females), Sarawak (males & females); Brunei (males); Kalimantan (males & female)]. – Zaidi & Nordin, 2001, Serangga, 6(1):181 (Crocker Range Park). – Zaidi et al, 2004, Crocker Range Scientific Expedition 2002: 200 (Sabah, Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519 m, 14.iii.2005, Aida, Tun, Azman, Sinail, 14 males; 14.iii.2005, Pete, Ali, T.Wan, Johnny, 9 males; 15.iii.2005, Aida, Tun, Azman, Sinail, 9 males; 14.iii.2005, Pete, Ali, T.Wan, Johnny, 5 males; Kinabalu Park, Alt 1602 m, 20.iii.2005, Aida,

Tun, Azman, Sinail, 1 male; 21.iii.2005, Aida, Tun, Azman, Sinail, 1 male.

### 18. *Puranoides* sp1

Materials examined: MALAYSIA, Sabah, Tambunan, Mahua, Alt:1075m, 16.iii.2005, Aida, Tun, Azman, Sinail, 1 male, 2 females; 17.iii.2005, Aida, Tun, Azman, Sinail, 2 females.
Remarks: The identity needs further confirmation to be described as new species.

### 19. *Puranoides* sp2

Materials examined: MALAYSIA, Sabah, Sayap, Alt:948-956m, 18.iii.2005, Pete, Ali, T.Wan, Johnny, 1 female; 19.iii.2005, Aida, Tun, Azman, Sinail, 1 male; 19.iii.2005, Pete, Ali, T.Wan, Johnny, 1 female.
Remarks: The identity needs further confirmation to be described as new species.

### 20. *Pomponia graecina* Distant

*Pomponia graecina* Distant, 1889, Ann. Mag. Nat. Hist. 6(3):421 [North Borneo, Mt. Kinabalu (type, male)]. - Moulton, 1923, J.Fed. Mal. St. Mus., 11:112 (Borneo). – Zaidi & Nordin, 2001, Serangga, 6(1):183 (Crocker Range Park). – Zaidi et al, 2004, Crocker Range Scientific Expedition 2002: 200 (Sabah, Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Sayap, Alt:948-956m, 19.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male; Kinabalu Park, 1602m, 19.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male.

### 21. *Pomponia lactea* (Distant)

*Leptopsaltria acteal* Distant, 1887, Ann. Mag. Nat. Hist. 5, 11:229 [Sumatra (type, male)].

*Pomponia acteal:* Distant, 1891, Monogr. Orient Cicad., 1&2: 71 (Perak; Sumatra). – Moulton, 1923, J.Fed. Mal. St. Mus., 11:111 (Borneo, Brunei, Sumatra; Java; Malay Peninsula). – Zaidi & Nordin, 2001, Serangga, 6(1):181 (Sabah, Crocker Range Park) . – Zaidi et al, 2004, Crocker Range Scientific Expedition 2002: 200 (Sabah, Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Tambunan, Mahua, Alt1075m, 16.iii.2005, Aida, Tun, Azman, Sinail, 4 males; 16.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male, 3 females; 17.iii.2005, Pete, Ali, T.Wan, Johnny, 1 female; Sayap, Alt:948-956m, 18.iii.2005, Aida, Tun, Azman, Sinail, 1 female; 19.iii.2005, Aida, Tun, Azman, Sinail, 1 female; 19.iii.2005, Pete, Ali, T.Wan, Johnny, 1 female.

### 22. *Pomponia merula* (Distant)

*Pomponia merula* Distant, 1905, Ann. Mag. Nat. Hist., 7(15):68 [Sarawak (type, male)].- Moulton, 1923, J.Fed. Mal. St. Mus., 11:108 (Borneo, Sarawak). – Zaidi & Nordin, 2001, Serangga, 6(1):183 (Crocker Range Park). – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 191, 195 (Sabah: Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 14.iii.2005, Aida, Tun, Azman, Sinail, 2 males.

### *23. Nelcyndana tener* (Stal)

*Tibicen tener* Stal 1870, Ofv. Kongl. Vet.-Akad. Forhandl., Arg., 27:716 (Philippines). – Distant 1892, Monog. Orient. Cicad., 6:130 (Philippines).

*Nelcyndana tener*: Moulton 1923, J. Fed. Mal. St. Mus., 11:157 (Philippines; North Borneo, sandakan; Sarawak, Tutau River). – Zaidi *et al.,* 2004, Crocker Range Scientific Expedition 2002: 192, 201 (Sabah: Crocker Range Park).

Materials examined: MALAYSIA, Sabah, Tambunan, Mahua, Alt:1075m, 16.iii.2005, Pete, Ali, T.Wan, Johnny, 1 male.
Remarks: This is a new record for Crocker Range Park.

### 24. *Muda* sp.

Materials examined: MALAYSIA, Sabah, Penampang, Ulu Inobong, Alt:519m, 15.iii.2005, Aida, Tun, Azman, Sinail, 11 females; Tambunan, Mahua, Alt:1075m, 16.iii.2005, Aida, Tun, Azman, Sinail, 1 male, 1 female; Sayap, Alt:948-956m, 18.iii.2005, Aida, Tun, Azman, Sinail, 1 female; 19.iii.2005, Aida, Tun, Azman, Sinail, 1 male, 1 female; Poring, Alt:500m, 20.iii.2005, Aida, Tun, Azman, Sinail, 1 female.
Remarks: The identity needs further confirmation to be described as new species.