

## ORTHOPTERA IN PULAU UBIN

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### INTRODUCTION

A preliminary inventory of the common species of Orthoptera found in vegetation in Pulau Ubin is presented here. In particular, managed and spontaneous vegetation along the Sensory Trail were investigated. Pulau Ubin, being identified as a nature area (URA, undated), may function as a wildlife refuge for orthopteran species that may otherwise be rare in the urbanised Singapore mainland. However, with an increase in the percentage of built-up area (Sha, 2002), urban development on the island remains a threat to the biodiversity in Pulau Ubin. Therefore, the objectives of the paper are to inform the public of the orthopteran diversity in Pulau Ubin as part of Singapore's natural heritage and to emphasise the need to "hang on" to (Chang, 2005) that which remains.

### METHODS

From Dec.2009 to Jun.2010, visits were made to the vegetation sites along the Sensory Trail of Pulau Ubin. Collections were carried out during the day unless specifically stated. At least one adult specimen of each species was collected and euthanized using a freezer. The specimens were photographed using Canon EOS 500D digital SLR camera with compact-macro lens EF 50 mm f/2.5, examined with the use of a stereozoom microscope and identified using keys (Willemse, 1930; Chopard, 1931; Ragge, 1961; Hollis, 1968, 1971; Murphy, 1973; Otte & Alexander, 1983; Willemse, 2001; Kim & Kim, 2001, 2002; Wang & Shi, 2005; Ingrisch, 2006; Mahmood et al., 2007, 2007; Zhou et al., 2010). Morphometric features were measured using a 0.05 mm vernier caliper, whenever possible. In addition, Luc Willemse, Sam Heads, Sigfrid Ingrisch, Hendrik Devriese, Shi Fu-Ming, Laure Desutter, and Liu Xianwei kindly identified and verified the orthopterans. Some of the specimens were subsequently preserved as voucher specimens at the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR), National University of Singapore.

In the figure legends, the following abbreviation is used, SL = total dorsal length from the tip of head to the tip of wing or end of hind tarsus, whichever is longest.

### OBSERVATIONS AND DISCUSSION

The following species were observed or collected:

#### **Tetrigidae: Tetriginae**

*Euparatettix variabilis* (Bolivar, 1887) (Fig. 1)

*Euparatettix* sp. (Fig. 2)

*Coptotettix* sp. (Fig. 3)

#### **Tetrigidae: Scelimeninae**

*Thoradonta* sp. (Fig. 4)

#### **Acrididae: Acridinae**

*Phlaeoba infumata* (Brunner von Wattenwyl, 1893) (Fig. 5)

*Phlaeoba antennata* (Brunner von Wattenwyl, 1893) (Fig. 6)

*Acrida willemsei* (Dirsh, 1954) (Figs. 7a, b, c)

*Aiolopus thalassinus tamulus* (Fabricius, 1798) (Fig. 8)

#### **Acrididae: Oedipodinae**

*Trilophidia annulata* (Thunberg, 1815) (Fig. 9)

**Acrididae: Catantopinae**

*Traulia azureipennis* (Serville, 1839) (Figs. 10a, b)

*Xenocatantops humilis* (Serville, 1839) (Fig. 11)

*Apalacris varicornis* (Walker, 1870) (Fig. 12)

**Acrididae: Cyrtacanthacridinae**

*Valanga nigricornis* (Burmeister, 1838) (Fig. 13)

**Acrididae: Coptacridinae**

*Epistaurus aberrans* (Brunner von Wattenwyl, 1893) (Figs. 14a, b)

**Acrididae: Spathosterninae**

*Spathosternum prasiniferum* (Walker, 1871) (Figs. 15a, b, c, d)

**Acrididae: Oxyinae**

*Oxya japonica japonica* (Thunberg, 1824) (Fig. 16)

*Oxya hyla intricata* (Stal, 1861) (Fig. 17)

*Pseudoxya diminuta* (Walker, 1871) (Fig. 18)

**Pyrgomorphidae: Pyrgomorphinae**

*Tagasta marginella* (Thunberg, 1815) (Fig. 19)

*Atractomorpha psittacina psittacina* (de Haan, 1842) (Figs. 20a, b, c)

*Atractomorpha* sp. (Fig. 21)

**Tettigoniidae: Mecopodinae**

*Mecopoda elongata* (Linnaeus, 1758) (Figs. 22a, b)

**Tettigoniidae: Phaneropterinae**

*Ducetia japonica* (Thunberg, 1815) (Figs. 23a, b)

*Phaneroptera brevis* (Serville, 1838) (Fig. 24)

**Tettigoniidae: Conocephalinae**

*Conocephalus maculatus* (Le Guillou, 1841) (Fig. 25)

*Conocephalus longipennis* (de Haan, 1842) (Fig. 26)

*Conocephalus melaenus* (de Haan, 1842) (Fig. 27)

**Tettigoniidae: Listroscolidinae**

*Hexacentrus unicolor* (Serville, 1831) (Fig. 28)

**Mogoplistidae: Mogoplistinae**

*Ornebius* sp. (Figs. 29a, b)

**Gryllidae: Trigonidiinae**

*Metioche pallipes* (Stal, 1861) (Fig. 30)

*Homoeoxipha lycoides* (Walker, 1869) (Fig. 31)

**Gryllidae: Euscyrtinae**

*Euscyrtus concinnus* (de Haan, 1842) (Fig. 32)

*Patiscus* sp. (Fig. 33)

**Gryllidae: Eneopterinae**

*Lebinthus* sp. (Figs. 34a, b)

**Gryllidae: Nemobiinae**

*Pteronemobius* sp. (Fig. 35)

**Gryllidae: Gryllinae**

*Velarifictorus* sp. (Fig. 36)

*Loxoblemmus* sp. (Fig. 37)

*Teleogryllus* sp. (Figs. 38a, b)

**Gryllidae: Landrevinae**

*Duolandrevus* sp. (Fig. 39)

Thirty nine common species of Orthoptera from 33 known genera were recorded, of which 21 species of grasshoppers (Acrididae, Tetrigidae, and Pyrgomorphidae), seven species of katydids (Tettigoniidae) and 11 species of crickets (Gryllidae and Mogoplistidae) were examined. The diversity of Orthoptera along the Sensory Trail is heartening because it is possible for relatively large number of visitors to observe orthopterans easily without travelling far away from Pulau Ubin village. This in turn can play an important role in promoting greater public awareness and appreciation of local orthopterans. However, the inventory presented here may at most be representative of the orthopteran diversity of the Sensory Trail since surveys were concentrated here. Therefore, the paper also aims to “provide necessary baseline for more studies” (Chua, 2010) on the orthopterans in Pulau Ubin.

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Fig. 1. *Euparatettix variabilis* (Bolivar, 1887) female. Collected on 7 Feb.2010. SL = 13.65 mm. ZRC.ORT.34.



Fig. 2. *Euparatettix* sp. female. Collected on 2 Jun.2010. SL = 14.25 mm. ZRC.ORT.35.



Fig. 3. *Coptotettix* sp. male. Collected on 6 Jun.2010. SL = 15.35 mm.





Fig. 4. *Thoradonta* sp. male. Collected on 6 Jun.2010. SL = 11.05 mm. ZRC.ORT.36.



Fig. 5. *Phlaeoba infumata* (Brunner von Wattenwyl, 1893) male. Collected on 29 Jan.2010. SL = 30.85 mm.



Fig. 6. *Phlaeoba antennata* (Brunner von Wattenwyl, 1893) female. Collected on 21 Feb.2010. SL = 45.45 mm. ZRC.ORT.30.

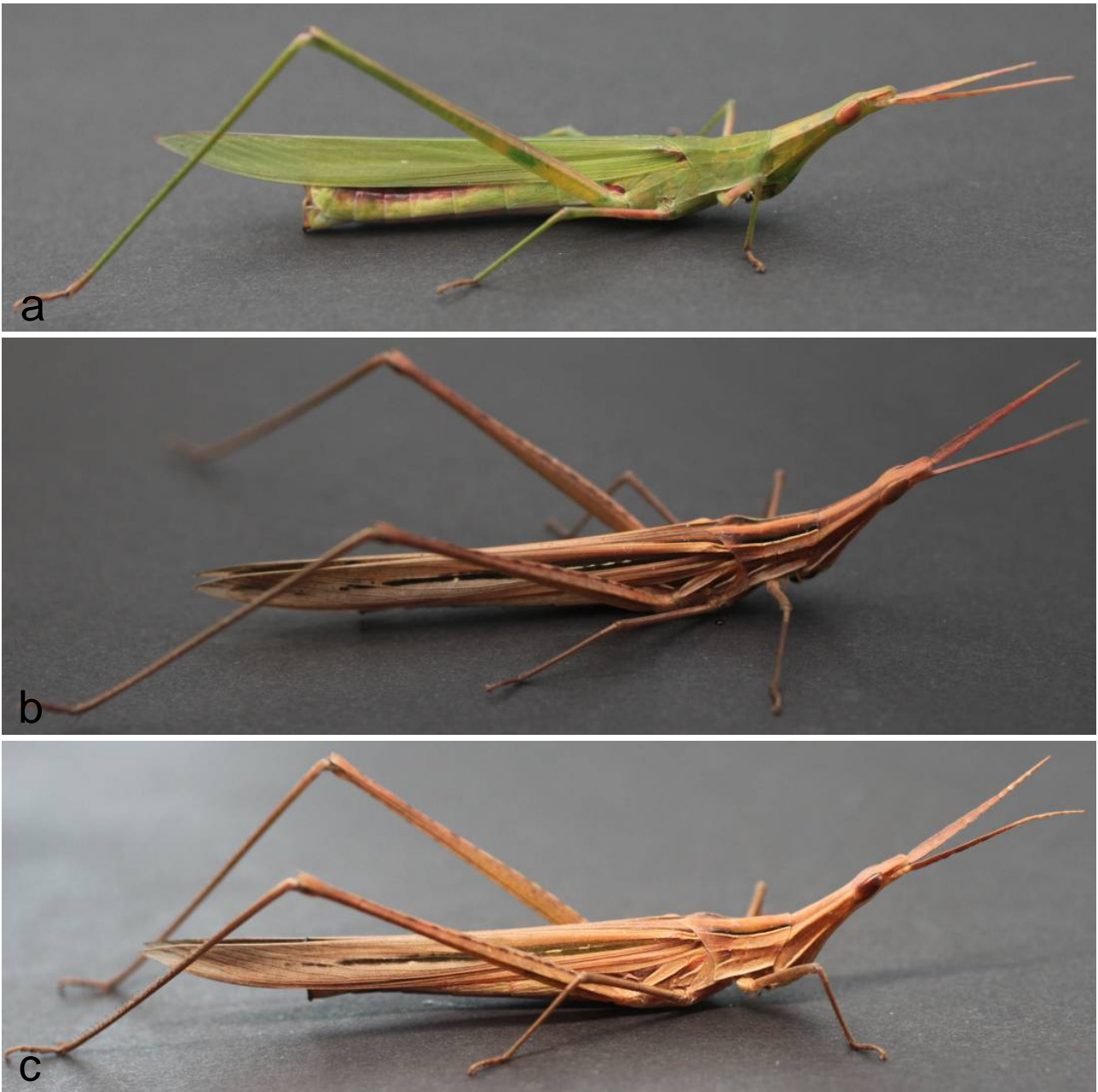


Fig. 7. *Acrida willemsi* (Dirsh, 1954). a. Female. Collected on 17 Apr.2010 (night). SL = 93.00 mm. ZRC.ORT.31. b. Female. Collected on 17 Apr.2010 (night). SL = 92.60 mm. ZRC.ORT.31. c. Female. Collected on 17 Apr.2010 (night). SL = 97.00 mm. ZRC.ORT.31.





Fig. 8. *Aiolopus thalassinus tamulus* (Fabricius, 1798) female. Collected on 8 Feb.2010. SL = 36.35 mm. ZRC.ORT.32.



Fig. 9. *Trilophidia annulata* (Thunberg, 1815) male. Collected on 8 Feb.2010. SL = 23.25 mm. ZRC.ORT.33.



Fig. 10. *Traulia azureipennis* (Serville, 1839). a. Male. Collected on 3 Dec.2009 (night). SL = 34.85 mm. ZRC.ORT.24. b. Female. Collected on 3 Dec.2009 (night). SL = 52.50 mm. ZRC.ORT.25.



Fig. 11. *Xenocatantops humilis* (Serville, 1839) female. Collected on 13 Mar.2010. SL = 40.00 mm. ZRC.ORT.26.





Fig. 12. *Apalacris varicornis* (Walker, 1870) female. Collected on 8 Mar.2010. SL = 35.80 mm. ZRC.ORT.27.



Fig. 13. *Valanga nigricornis* (Burmeister, 1838) male. Collected on 4 Dec.2009. SL = 69.40 mm. ZRC.ORT.28.



Fig. 14. *Epistaurus aberrans* (Brunner von Wattenwyl, 1893). a. Female. Collected on 14 Jan.2010. SL = 27.45 mm. b. Male. Collected on 13 Mar.2010. SL = 24.10 mm. ZRC.ORT.29.









Fig. 15. *Spathosternum prasiniferum* (Walker, 1871). a. Female. Collected on 17 Jan.2010. SL = 28.05 mm. ZRC.ORT.17. b. Female. Collected on 17 Jan.2010. SL = 27.80 mm. ZRC.ORT.17. c. Male. Collected on 7 Feb.2010. SL = 22.45 mm. ZRC.ORT.18. d. Female. Collected on 27 Feb.2010. SL = 28.10 mm. ZRC.ORT.19.



Fig. 16. *Oxya japonica japonica* (Thunberg, 1824) male. Collected on 7 Mar.2010. SL = 33.20 mm. ZRC.ORT.16.



Fig. 17. *Oxya hyla intricata* (Stal, 1861) male. Collected on 22 May.2010 (night). SL = 29.90 mm. ZRC.ORT.15.



Fig. 18. *Pseudoxya diminuta* (Walker, 1871) female. Collected on 24 May.2010. SL = 36.30 mm.



Fig. 19. *Tagasta marginella* (Thunberg, 1815) female. Collected on 4 Dec.2009 (night). SL = 38.40 mm. ZRC.ORT.20.





Fig. 20. *Atractomorpha psittacina psittacina* (de Haan, 1842). a. Male. Collected on 7 Mar.2010. SL = 32.40 mm. ZRC.ORT.21. b. Male. Collected on 7 Mar.2010. SL = 32.50 mm. ZRC.ORT.21. c. Male. Collected on 8 Mar.2010. SL = 34.25 mm. ZRC.ORT.22.



Fig. 21. *Atractomorpha* sp. female. Collected on 28 Mar.2010. SL = 37.25 mm. ZRC.ORT.23.



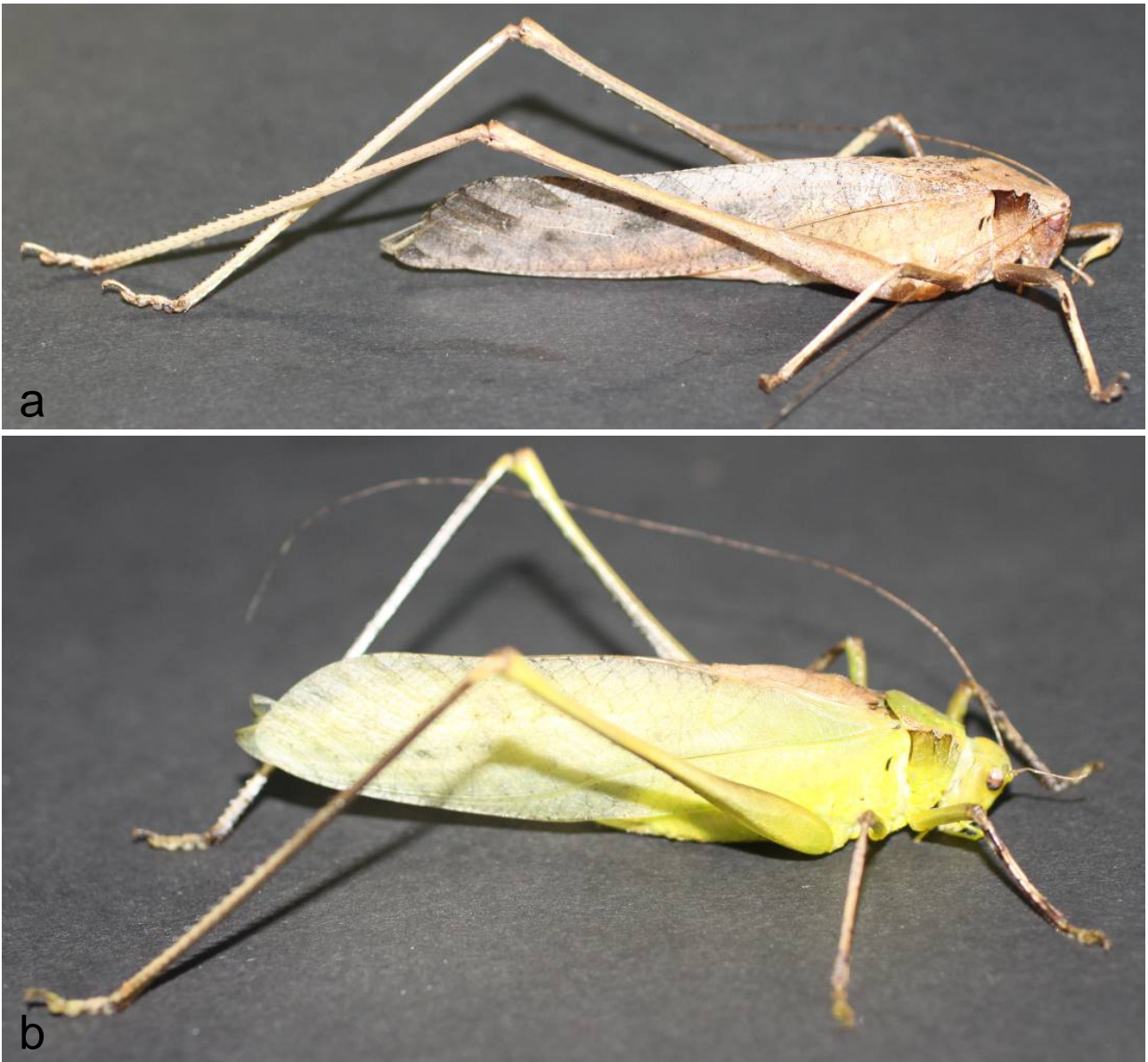


Fig. 22. *Mecopoda elongata* (Linnaeus, 1758). a. Female. Collected on 3 Dec.2009 (night). SL = 119.40 mm. ZRC.ORT.37. b. Male. Collected on 4 Dec.2009 (night). SL = 104.65 mm. ZRC.ORT.38.

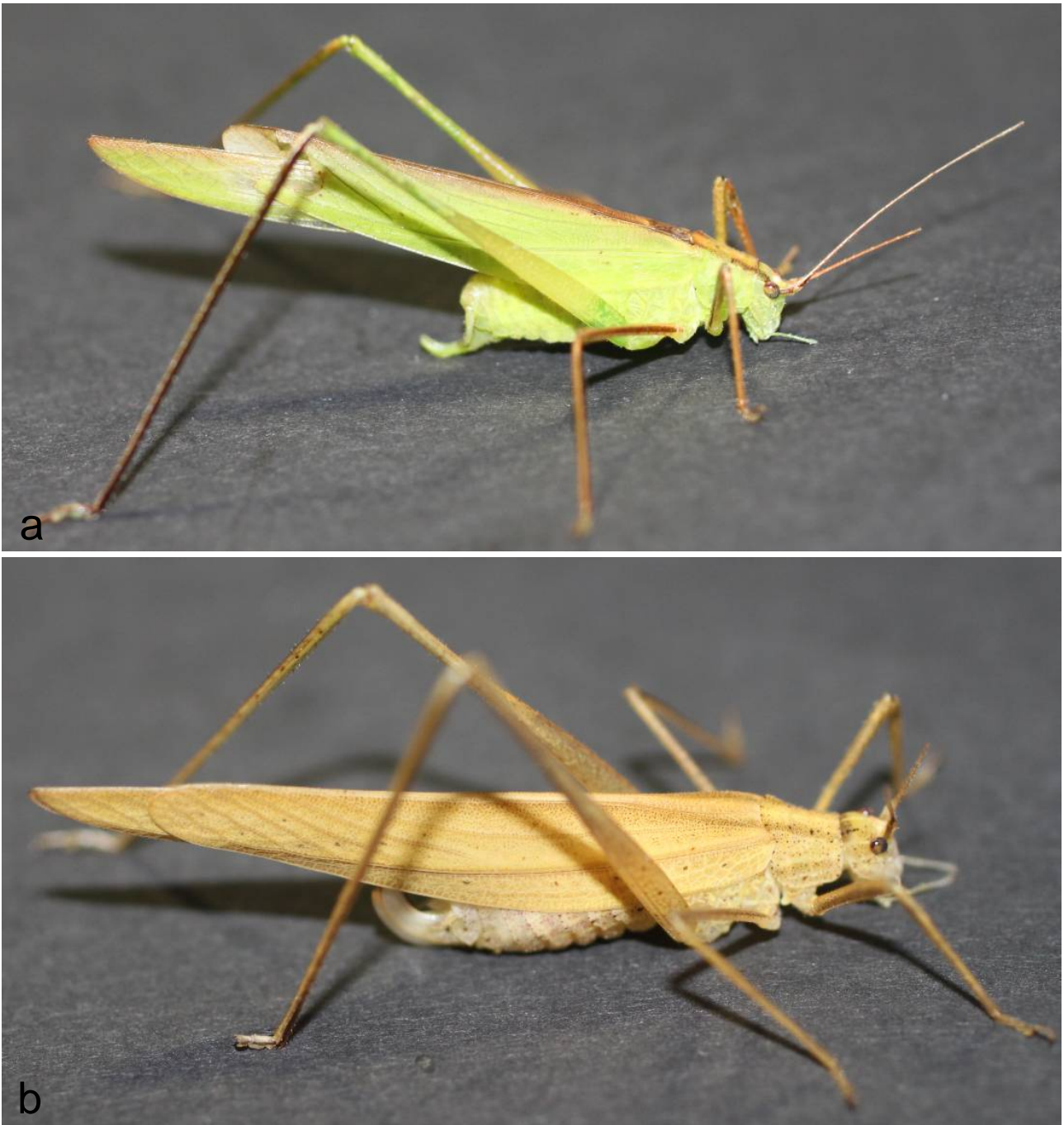


Fig. 23. *Ducetia japonica* (Thunberg, 1815). a. Male. Collected on 8 Mar.2010. SL = 48.30 mm. ZRC.ORT.39. b. Female. Collected on 23 Apr.2010 (night). SL = 53.40 mm. ZRC.ORT.40.



Fig. 24. *Phaneroptera brevis* (Serville, 1838) female. Collected on 28 Mar.2010. SL = 39.90 mm. ZRC.ORT.41.



Fig. 25. *Conocephalus maculatus* (Le Guillou, 1841) male. Collected on 29 May.2010 (night). SL = 32.80 mm. ZRC.ORT.42.



Fig. 26. *Conocephalus longipennis* (de Haan, 1842) male. Collected on 23 Apr.2010 (night). SL = 39.15 mm. ZRC.ORT.43.





Fig. 27. *Conocephalus melaenus* (de Haan, 1842) male. Collected on 29 May.2010 (night). SL = 40.05 mm. ZRC.ORT.44.



Fig. 28. *Hexacentrus unicolor* (Serville, 1831) male. Collected on 23 Apr.2010 (night). SL = 54.05 mm. ZRC.ORT.45.



a



b

Fig. 29. *Ornebius* sp. a. Male. Collected on 29 Jan.2010. SL = 28.10 mm. ZRC.ORT.46. b. Female. Collected on 21 Feb.2010. SL = 25.40 mm.



Fig. 30. *Metioche pallipes* (Stal, 1861) male. Collected on 8 Feb.2010. SL = 13.85 mm.





Fig. 31. *Homoeoxipha lycoides* (Walker, 1869) male. Collected on 18 Jun.2010 (night). SL = 11.55 mm.



Fig. 32. *Eusecyrtus concinnus* (de Haan, 1842) male. Collected on 20 Mar.2010. SL = 21.90 mm. ZRC.ORT.47.



Fig. 33. *Patiscus* sp. female. Collected on 17 Apr.2010 (night). SL = 31.05 mm. ZRC.ORT.48.



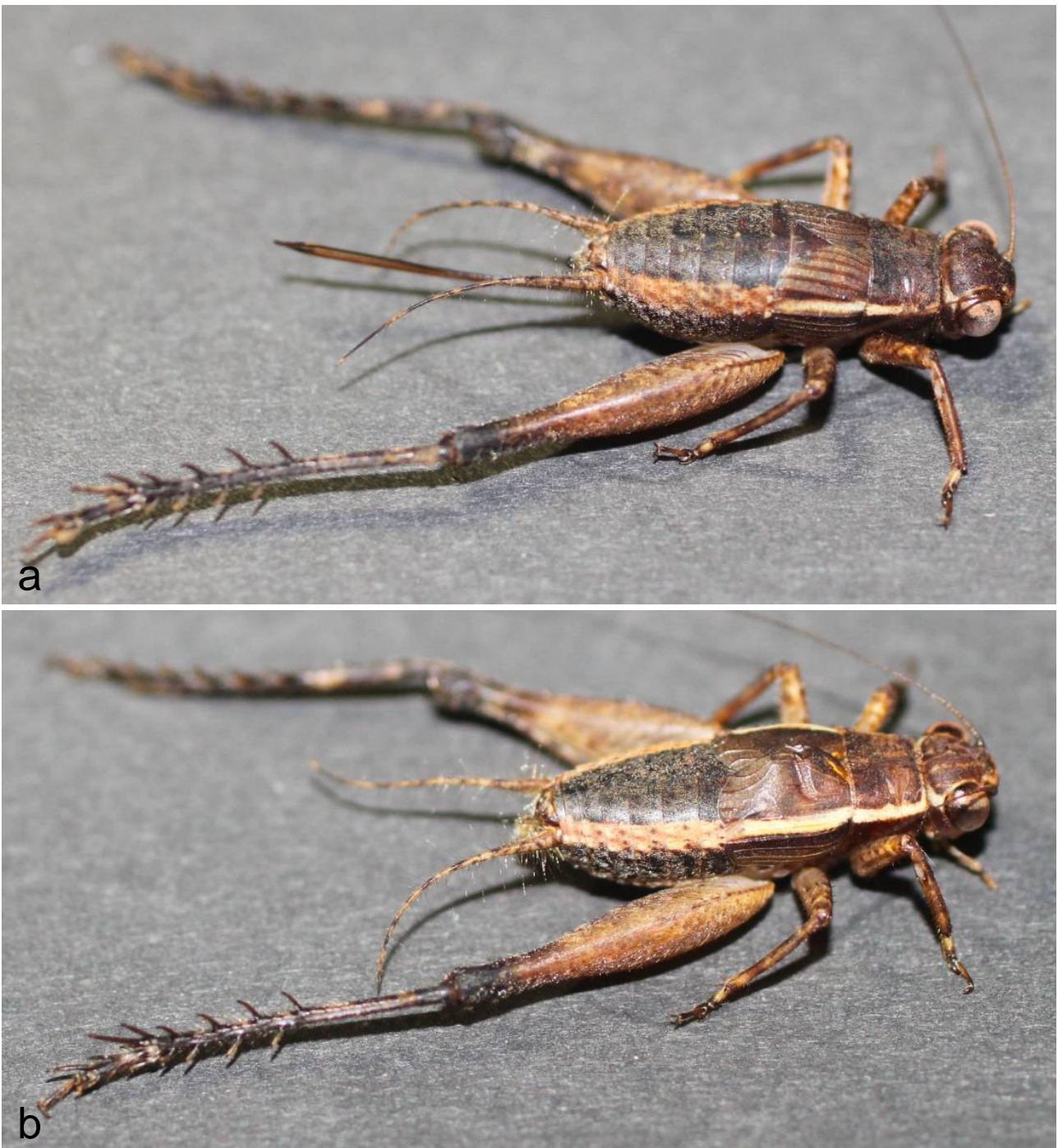


Fig. 34. *Lebinthus* sp. a. Female. Collected on 4 Dec.2009 (night). SL = 36.70 mm. ZRC.ORT.49. b. Male. Collected on 4 Dec.2009 (night). SL = 32.55 mm. ZRC.ORT.50.



Fig. 35. *Pteronemobius* sp. male. Collected on 2 Jun.2010. SL = 11.00 mm.



Fig. 36. *Velarifictorus* sp. male. Collected on 23 Apr.2010 (night). SL = 27.50 mm. ZRC.ORT.51.





Fig. 37. *Loxoblemmus* sp. male. Collected on 23 Apr.2010 (night). SL = 26.25 mm. ZRC.ORT.52.

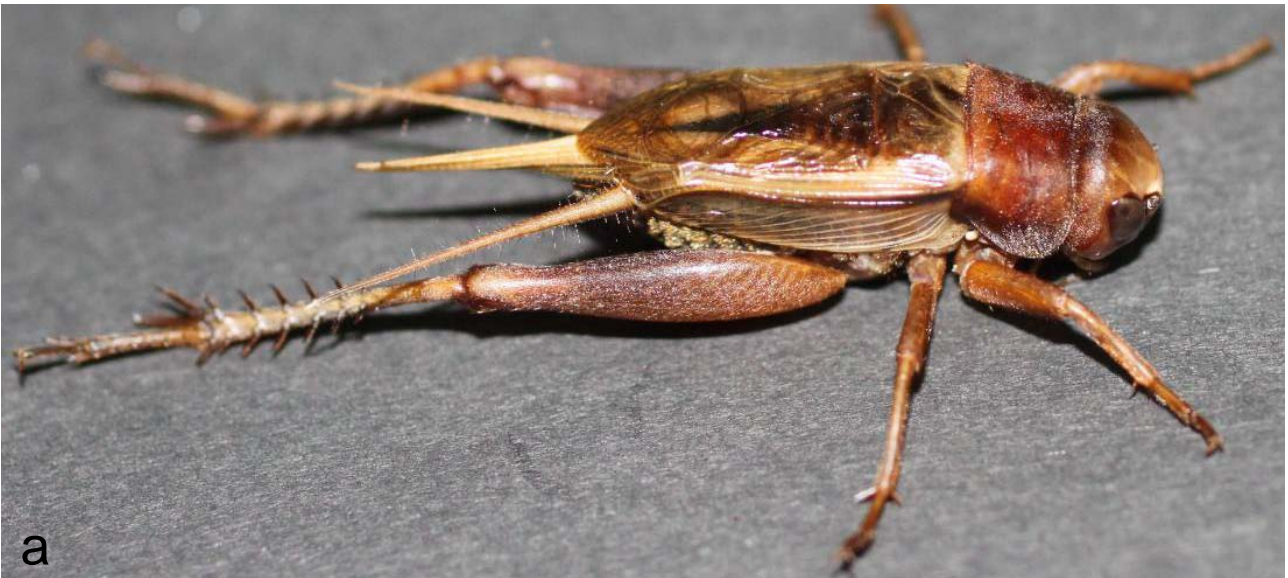


Fig. 38. *Teleogryllus* sp. a. Male. Collected on 29 May.2010 (night). SL = 45.30 mm. ZRC.ORT.53. b. Male. Collected on 18 Jun.2010 (night). SL = 47.30 mm. ZRC.ORT.54.





Fig. 39. *Duolandrevus* sp. female. Collected on 18 Jun.2010 (night). SL = 32.15 mm. ZRC.ORT.14.