The Cicadas of Thailand (Hemiptera: Cicadidae)

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ABSTRACT

Recent fieldwork in Thailand has led to the production of this list of genera and species found within the country. A total of 152 species with 5 additional varieties and one undescribed species from 35 genera have been identified. Records for eight species are reported for the first time in addition to the first specimens of the genus *Muda* and fifteen new species adding to the diversity of the cicada fauna of Thailand. Eight other species are removed from the Thai cicada fauna. Major areas of diversity are the northwest region of the country and the Thai peninsula.

INTRODUCTION

The cicadas of Thailand have received little attention until recently. Specimens were identified as part of the Thai fauna generally as individual species were described or as a part of a much larger reference work. It was not until the recent work of Boulard (see summary in Boulard 2005a for the results of five years of field work dedicated to studying the Thai cicada fauna including the description of fifty new species and five varieties) that significant additions to the Thai cicada fauna have been reported.

Our collections of cicada specimens were conducted while sampling for adults of aquatic insects as part of several nationwide biogeographic and faunistic projects focusing on aquatic and semiaquatic insects from 1997-2005.

MATERIALS & METHODS

Specimens were captured during our expeditions (RWS) from 1997-2005. Cicadas were mainly captured in black light pan traps, although specimens were also collected whenever found. Data from additional specimens were obtained from various museum collections.

Specimens were identified and the literature reviewed in order to determine the Thai cicada fauna. The bibliographies by Metcalf (1963a, b, c) and Duffels & van der Laan (1985) were consulted to find literature which mention Thai cicadas. These references, as well as the more recent literature, were then compiled and checked to determine the species of the Thai cicada fauna and any collection localities mentioned in the articles. If not provided in the original reference, latitude and longitude information for available sites was compiled from the U.S. Geological Survey GEOnet Names Server (http://gnswww.nga.mil/GNS/index.jsp). Distribution maps were produced using iMAP.

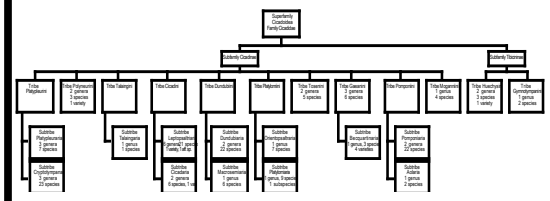

Figure 1. Taxonomic hierarchy of Thai cicadas. Representatives of two subfamilies, 12 tribes, and 35 genera have been identified in the Thai cicada fauna. The subtribes Cryptotympanaria, Dundubiaria, Pomponiaria, and Leptopsaltriaria have the greatest diversity of species representing more than half the total number of species present in Thailand.

RESULTS

A total of 152 species and one undescribed (*Purana* aff. *tigrina*) species have been identified from Thailand. Figure 1 illustrates the taxonomical hierarchy and species diversity for the cicadas of Thailand.

Superfamily Cicadoidea
Family Cicadidae
Subfamily Cicadinae
Tribe Platypleurini
Subtribe Platypleuraria
Afzeliada badia (Distant, 1888) **new record**
Platypleura arminops Noualhier, 1896
Platypleura auropilosa Kato, 1940
Platypleura mira Distant, 1904
Platypleura nobilis (Germar, 1830)
Platypleura watsoni (Distant, 1897)
Pycna concinna Boulard, 2005a
Subtribe Cryptotympanaria
Chremistica n. sp. nr. *bimaculata*
Chremistica chueatae Boulard, 2004
Chremistica echinaaria Yaakop and Duffels, submitted
Chremistica germana (Distant, 1888)
Chremistica guamusangensis Salmah & Zaidi, 2002 **new record**
Chremistica malayensis Yaakop and Duffels, submitted
Chremistica moultoni Boulard, 2002a
Chremistica mussarens Boulard, 2005g
Chremistica nesiotes Breddin, 1905
Chremistica n. sp. 1
Chremistica n. sp. 2
Chremistica numida (Distant, 1911)
Chremistica ochracea (Walker, 1850)
Chremistica pontianaka (Distant, 1888)
Chremistica siamensis Bregman, 1985
Chremistica viridis (Fabricius, 1803)
Cryptotympana aquila (Walker, 1850)
Cryptotympana facialis (Walker, 1858)
Cryptotympana fumipennis (Walker, 1858)
Cryptotympana gracilis Hayashi, 1987a
Cryptotympana mandarina Distant, 1891
Cryptotympana recta (Walker, 1850)
Salvazana mirabilis Distant, 1913
Tribe Polyneurini
Angamiana floridula Distant, 1904
Angamiana floridula var. *buaflei* Boulard, 1994
Angamiana melanoptera Boulard, 2005e
Formotosena montivaga (Distant, 1889)
Tribe Talaingini
Subtribe Talaingaria
Talainga binghami Distant, 1890
Tribe Cicadini
Subtribe Leptopsaltriaria
Leptopsaltria draluobi Boulard, 2003e
Purana atrociines Boulard, 2002a
Purana doiluangensis Boulard, 2005b
Purana guttularis (Walker, 1858)
Purana jdmoorei Boulard, 2005b
Purana johanae Boulard, 2005b
Purana khuanae Boulard, 2002a
Purana khuniensis Boulard, 2005k
Purana pigmentata Distant, 1905
Purana n. sp. nr. *sagittata*
Purana n. sp.1
Purana n. sp. 2
Purana aff. *tigrina* in Gogala, 1994
Purana tigrina (Walker, 1850)
Purana ubina Moulton, 1923
Rustia dentivitta (Walker, 1862)
Rustia dentivitta var. *amuesitata* (Distant, 1888)
Masua quadrituberculata (Signoret, 1847)
Puranoides klossi Moulton, 1917
Tanna ventriroseus Boulard, 2003d
Tanna n. sp. nr. *ventriroseus*
Tanna yanni Boulard, 2003e
Subtribe Cicadaria
Terpnosia abdullah Distant, 1904
Terpnosia neocollina Liu, 1940
Terpnosia nonusaprilis Boulard, 2003d
Terpnosia praeus (Walker, 1850)
Terpnosia viridissima Boulard, 2005c
Enterpnosia chibensis maiensis Boulard, 2005b
Tribe Dundubiini
Subtribe Dundubiaria
Dundubia ayutthaya Beuk, 1996
Dundubia crepitans Boulard, 2005k
Dundubia feae (Distant, 1892)
Dundubia hastata (Moulton, 1923)
Dundubia intemerata Walker, 1857
Dundubia kebuna Moulton, 1923
Dundubia nagarasingha Distant, 1881
Dundubia nigripes (Moulton, 1923) **new record**
Dundubia oopaga (Distant, 1881)
Dundubia rufivena Walker, 1850
Dundubia somrajt Boulard, 2003c
Dundubia spicalata Noualhier, 1896
Dundubia sinbryudew Beuk, 1996
Dundubia terpsichore (Walker, 1850)
Dundubia vaginata (Fabricius, 1787)
Meimuna duffelsi Boulard, 2005k
Meimuna durga (Distant, 1881)
Meimuna jsguillotsi Boulard, 2005k
Meimuna nauhkze Boulard, 2005b
Meimuna n. sp. 1
Meimuna n. sp. 2
Meimuna tavoyana (Distant, 1888)
Subtribe Macrosemiaria
Macrosemia chantrainei Boulard 2003b
Macrosemia giovannae Boulard, 2005c
Macrosemia khuanae Boulard 2001d
Macrosemia longiterebra Boulard 2003a
Macrosemia tonkiniana (Jacobi, 1905)
Macrosemia umbrata (Distant, 1888)
Tribe Platylomiini
Subtribe Orientopsaltriaria
Orientopsaltria beandouini Boulard, 2003b
Orientopsaltria cantavis Boulard, 2003e
Orientopsaltria fangrayae Boulard, 2001
Orientopsaltria guttigera (Walker, 1856) **new record**
Orientopsaltria lucieni Boulard, 2005c
Orientopsaltria musicus Boulard, 2005k
Orientopsaltria padda (Distant, 1887)
Subtribe Platylomiaria
Platylomia andamanesidensis Boulard, 2001
Platylomia bocki (Distant, 1882)
Platylomia malickyi Beuk, 1998
Platylomia operculata Distant, 1913
Platylomia pendleburyi Moulton, 1923
Platylomia operculata Distant, 1913
Platylomia saturata peraluana Moulton, 1923
Platylomia nr. *similis* (Distant, 1888)
Platylomia stasserae Boulard, 2005c
Tribe Tosenini
Tosena albata (Distant, 1878)
Tosena melanoptera (White, 1846)
Tosena paviei (Noualhier, 1896)
Tosena splendida Distant, 1878
Ayuthia spectabile Distant, 1919
Tribe Gaeanini
Gaeana cheni Chou & Yao, 1985
Gaeana festiva (Fabricius, 1803)
Gaeana maculata consors Atkinson, 1884 **new record**
Ambragaeana ambra Chou & Yao, 1985
Ambragaeana stellata (Walker, 1858) **new record**
Balinta tenebriscosa (Distant, 1888)
Subtribe Becquartinaria
Becquartina versicolor Boulard, 2005i
Becquartina versicolor var. *chantrainei* Boulard, 2005i
Becquartina versicolor var. *flammea* Boulard, 2005i
Becquartina versicolor var. *fusculae* Boulard, 2005i
Becquartina versicolor var. *obscura* Boulard, 2005i
Becquartina bleuzeni Boulard, 2005i
Becquartina electa (Jacobi, 1902)
Tribe Pomponiini
Subtribe Pomponiaria
Pomponia dolosa Boulard 2001a
Pomponia fusca (Olivier, 1790)
Pomponia fuscacuminis Boulard, 2005b
Pomponia fuscoides Boulard, 2002a
Pomponia gemella Boulard, 2005b
Pomponia lactea (Distant, 1887)
Pomponia linearis (Walker, 1850)
Pomponia litildollae Boulard, 2002a
Pomponia n. sp. nr. *litildollae*
Pomponia namtokeala Boulard, 2005b
Pomponia nasanensis Boulard, 2005g
Pomponia n. sp.1
PompPomponia nouallieri Boulard, 2005b
Pomponia n. sp. nr. *nouallieri*
Pomponia quadrispinae Boulard, 2002a
Pomponia scitula Distant, 1888
*Megapomponia clamorigravis*Boulard, 2005e
Megapomponia imperatoria (Westwood, 1842)
Megapomponia intermedia Distant, 1905
Megapomponia pendleburyi Boulard 2001b
Megapomponia n. sp. 1
Megapomponia n. sp. 2
Subtribe Aolaria
Aola bindusara (Distant, 1881)
Aola talaiyai Boulard, 2005c
Tribe Moganniini
Mogannia caesar Jacobi, 1902
Mogannia conica (Germar, 1830) **new record**
Mogannia cyanea Walker, 1858
Mogannia saneia Noualhier, 1896
Subfamily Tibicininae
Tribe Huechysini
Huechys beata Distant, 1892 **new record**
Huechys sanguinea (De Geer, 1773)
Scieroptera splendidula var. *cuprea* (Walker, 1870)
Tribe Gymnotympanini
Muda n. sp. 1 **new generic record**
Muda n. sp. 2

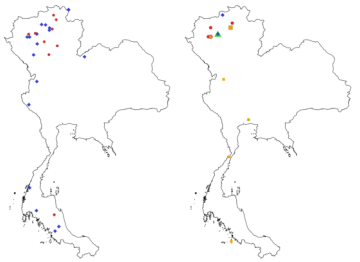

Figure 2. Distribution of the Platypleurini in Thailand, subtribes Platypleuraria (red circles) Cryptotympanaria (blue diamonds).

Figure 3. Distribution of the Tribes Polyneurini (blue diamonds), Talaingini (green triangles) and subtribes Leptopsaltriaria (orange squares) and Cicadaria (red circles) of the tribe Cicadini.

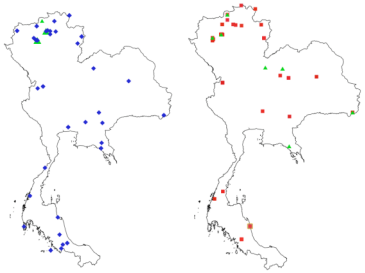

Figure 4. Distribution of the Subtribes Dundubiaria (blue diamonds) and Macrosemiaria (green triangles) of the Tribe Dundubiini.

Figure 5. Distribution of the subtribes Orientopsaltraria (green triangles) and Platylomiaria (red squares) of the Tribe Platylomiini.

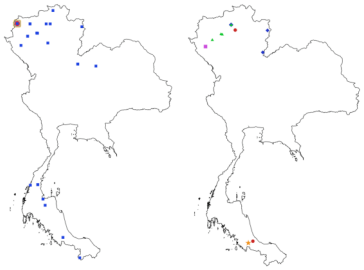

Figure 6. Distribution of the Subtribes Pomponiaria (blue squares) and Aolaria (red circle) of the Tribe Pomponiini.

Figure 7. Distribution of the Tribes Tosenini (green triangles), Gaeanini (blue diamonds), Moganniini (purple square), Huechysini (red circles) and Gymnotympanini (orange star).

The following species are removed from the Thai fauna for the reasons listed after each species.

Chremistica bimaculata (Olivier, 1790) Thai specimens determined as *C. bimaculata* are actually an undescribed species (Yaakop et al. submitted).
Cryptotympana vesta (Distant, 1904) These specimens are probably *C. gracilis* Hayashi (Hayashi 1987b).
Kalamata javanensis Distant, 1905 Siam listed as a question in Moulton (1923) who then states the species is restricted to Java.
Terpnosia andersoni Distant, 1892 Location in Ishihara (1961) is Nam Tha, Laos, not Thailand.
Platylomia similis (Distant, 1888) Specimens from Moulton (1923) actually undescribed species (Beuk, 1998).
Platylomia spinosa (Fabricius, 1787) Beuk (1996) questions accuracy of labels in his revision of the group.
Dundubia bifasciata Liu, 1940 Species synonymized to *D. hainanensis* (Distant, 1901) by Beuk (1996) but this species is not found in Thailand (Beuk 1996).
Pomponia adusta (Walker, 1850) Species is restricted to Java. Thai specimens are considered to be examples of *P. pendelburyi* (Boulard, 2001, 2005b).

DISCUSSION

Afzeliada badia, ***Chremistica guamusangensis***, ***Dundubia nigripes***, ***Orientopsaltria guttigera***, ***Gaeana maculata consors***, ***Ambragaeana stellata***, ***Mogannia conica***, ***Huechys beata,*** and two species of the genus ***Muda*** are each described from Thailand for the first time. Eight species are removed from the Thai cicada fauna. New species of ***Chremistica*** (2), ***Meimuna*** (2), ***Megapomponia*** (2), ***Pomponia*** (3), ***Purana*** (3), ***Tanna***, and ***Muda*** (2) have been identified.

The distributions of the individual tribes are influenced significantly by the limited number of collection sites. Significant areas of cicada diversity are found in the extreme northern and southern regions of the country. These regions have species or genera whose distributions extend into neighboring countries as well as mountains which can lead to reproductive isolation and speciation.

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