The first aim of this paper is to contribute to the knowledge of cicada biodiversity in Sundaland: the Malayan Peninsula south of the Isthmus of Kra, Sumatra, Borneo and Java, and the small islands between and around these islands. The cicada inventories in nature reserves and other areas in Peninsular Malaysia and in the Bornean states of Malaysia, Sabah and Sarawak, have been strongly intensified in the last decade under the supervision of the Center for Insect Systematics, Universiti Kebangsaan Malaysia and the Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah. These activities have greatly increased our knowledge of the cicada fauna (e.g. Zaidi & Ruslan 1995a, b, c). Many new species have been described and several genera have been revised taxonomically in recent years (e.g. Duffels & Zaidi 2000, Duffels 2004). Nevertheless, several genera still need to be revised, and quite a number of undescribed species are still awaiting description. Keys to genera and species, and good descriptions and illustrations of species greatly facilitate a reliable identification of the species. This basic systematic work is regarded as a prerequisite for further research on cicada biodiversity. Biodiversity studies of cicadas in Sulawesi, New Guinea, and the West Pacific, have already demonstrated that cicadas can be instrumental in recognizing hot spots of species richness and areas of endemism with unique biota (e.g., Boer & Duffels 1997).

The genus *Chremistica* Stål, 1870 contains 41 species occurring in Sundaland: Malayan Peninsula, Java, Sumatra and Borneo. Nine species were already known to science: *Chremistica biloba* Bregman, *C. bimaculata* (Olivier), *C. guamusangensis* Salmah & Zaidi, *C. kecil* Salmah & Zaidi, *C. minor* Bregman, *C. nesimae* Bregman, *C. pontianaka* (Distant), *C. tridentigera* (Breddin), and *C. umbrosa* (Distant). Eight species are new to science: *Chremistica borneensis*, *C. brooksi*, *C. cetacauda*, *C. cebinaris*, *C. boliuswayi*, *C. malayensis*, *C. nissica*, and *C. sumatrana*. The Sundaland species of *Chremistica* belong to three species groups: the *C. pontianaka* group, the *bimaculata* group and the *tridentigera* group. A key to the species is presented for the identification of the males of *Chremistica* from Sundaland. The geographical distributions of the species are presented in maps.

**THE CICADA GENUS *CHREMISTICA* STÅL**

**HEMIPTERA: CICADIDAE**

**IN SUNDALAND**


This study presents a revision of the 17 species of the cicada genus *Chremistica* Stål occurring in Sundaland: Malayan Peninsula, Java, Sumatra and Borneo. Nine species were already known to science: *Chremistica biloba* Bregman, *C. bimaculata* (Olivier), *C. guamusangensis* Salmah & Zaidi, *C. kecil* Salmah & Zaidi, *C. minor* Bregman, *C. nesimae* Bregman, *C. pontianaka* (Distant), *C. tridentigera* (Breddin), and *C. umbrosa* (Distant). Eight species are new to science: *Chremistica borneensis*, *C. brooksi*, *C. cetacauda*, *C. cebinaris*, *C. boliuswayi*, *C. malayensis*, *C. nissica*, and *C. sumatrana*. The Sundaland species of *Chremistica* belong to three species groups: the *C. pontianaka* group, the *bimaculata* group and the *tridentigera* group. A key to the species is presented for the identification of the males of *Chremistica* from Sundaland. The geographical distributions of the species are presented in maps.

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Key words. – *Chremistica*, Cicadidae; taxonomy; new species; key; distribution; Sundaland; South East Asia.
Cicada (Chremistica) tagalica and Cicada (Chremistica) semperi were attributed to Chremistica. In 1904, Distant (1904a) designated Cicada (Chremistica) viridis as the type species of Chremistica (see also the discussion at the end of this chapter).

In the same year, Distant (1904b) described the new genus Ribana with Fidicina ochracea Walker, 1850 as type species. The nomenclature became really confusing when, only two years later, Distant regarded Cicada (Chremistica) as a synonym of Ribana (Distant 1906a, b). In his synonymic catalogue of Cicadidae, Distant (1906b) included 44 species in the genus Ribana; 13 species of the genus Ribana (Distant, 1906a, b). In his synonymic catalogue of Ribana (Distant, 1906a, b), he published some annotations to Distant’s 1906 catalogue including the remark that Distant’s name Ribana should be a junior synonym of Chremistica. In spite of the fact that Kirkaldy’s correction was quite right, the name Ribana, instead of Chremistica, was used for almost two more decades. Horváth (1926), instead of Ribana, was Chremistica right, the name Chremistica spurious when, only two years later, Distant re- corded Ribana (Chremistica) as a synonym of Chremistica. In his classic publication ‘Cicadas of Malaysia’ Moulton (1923) presented a key to the five species of Ribana from Malaysia: R. pontianaka (Distant, 1888), R. germana (Distant, 1888), R. viridis (Fabricius, 1803), R. himaculata (Olivier, 1790) and R. pisanga Moulton 1923. The name ‘Malaysia’ was used by Moulton (l.c.) for the area comprising the Malay Peninsula south of the Isthmus of Kra, Sumatra, Borneo, Palawan, Java, Bali, and the small islands between and around these larger islands. Moulton’s ‘Malaysia’ stands for the same area that is called ‘Sundaland’ in the present paper. A few years later Singh-Pruthi (1925) and Moulton & China (1926) presented a revision of the Chremistica, of which 23 are recorded from South East Asia and Sundaland. The catalogue by respectively Liu (1940) and Chen (1940, 1943). The catalogue by Metcalf (1963), which includes all literature available at the end of the year 1955, lists 28 species of Chremistica, of which 23 are recorded from South East Asia including Sri Lanka, India and China.

An important contribution to the taxonomy of Chremistica was made by Bregman (1985). He presented a revision of the Chremistica tridentigera group (eleven species) from South East Asia and a phylogenetic analysis of the group mainly based on characters of the male genitalia. Bregman (l.c.) divided Chremistica into four subgroups: the martini group from Madagascar, the coronata group from the Lesser Sunda Islands, the pontianaka group from continental South East Asia and Sundaland, and the tridentigera group from Sri Lanka, South India, continental South East Asia and Sundaland. The martini group comprised: C. martini (Distant, 1905), C. pulvulenta (Distant, 1905), C. bosa (Distant, 1905) and C. nigrans (Distant, 1904). The coronata group comprised: C. coronata (Distant, 1889), C. operculissima (Distant, 1897) and C. timorensis (Distant, 1892). The pontianaka group comprised: C. atrovirens (Guérin-Méneville, 1838), C. germana (Distant, 1888), C. neisiotis (Brededin, 1905), C. numida (Distant, 1911), C. ochracea (Walker, 1850), C. pontianaka (Distant, 1888) and C. viridis (Fabricius, 1803). The tridentigera group comprised: C. atra (Distant, 1909), C. biloba Bregman, 1985, C. minor Bregman, 1985, C. mixta (Kirby, 1891), C. polybrunea (Walker, 1850), C. minutiger (Distant, 1909), C. semperi Stål, 1870, C. siamensis Bregman, 1985, C. tagalica Stål, 1870, C. tridentigera (Brededin, 1905) and C. umbrosa (Distant, 1904). In the last decade, two new species were described from China: Chremistica longa by Lei et al. (1995) and Chremistica maculata by Chou & Lei (1997). Recently Boulard (2000, 2001b) described three new species, C. leucopipterus Boulard, 2000, C. matilei Boulard, 2000 and C. elonga Boulard, 2001 from Madagascar and two new subspecies from the Seychelles. In 2002, Boulard also added one new species, C. moultoni, to the fauna of Thailand (Boulard 2002).

Classification
The taxonomic position of Chremistica
According to Hayashi (1987) Chremistica is closely related to Cryptotympana Stål, 1861 (South East Asia) and Tibicen Berthold, 1827 (= Lyristes Horváth, 1926) (Eurasia and North America). The cladistic analysis of the Cicadoidae presented by Moulds (in press) attributes Cryptotympana and Tibicen and five genera from Australia to a subgroup of the tribe Cryptotympanini. This subgroup is characterized by (1) the large tymbal covers, that reach laterally to the margin of the operculum and anteriorly to the metathorax, and tightly close the tymbal cavity, and (2) the much enlarged male tergites 2 and 3 with posterior margins that are strongly bent to the posterior at the lateral sides of the abdomen. These same characters are also found in Chremistica, so that this genus should be allocated in the same subgroup of the Cryptotympanini. According to Moulds (in press) Cryptotympana and Tibicen form a monophyletic group because the thecal apex is partly or entire membraneous. The narrow membranous apical part of the theca found in Chremistica suggests that this genus belongs to the same group. Hayashi (1987) also mentions the completely united uncus as a character.
for *Chremistica*, *Cryptotympana* and *Tibicen*.

*Chremistica* can be distinguished from *Tibicen* and *Cryptotympana* by the triangular head, which is 0.5-0.6 times as long as distance between eyes, the swollen and prominent postclypeus, the well developed median glabrous area on the postclypeus, and the well developed claspers with lateral and medial lobes. In *Tibicen* and *Cryptotympana*, the head is much shorter, the postclypeus less prominent and the glabrous area usually much smaller. *Cryptotympana* can be distinguished from *Chremistica* and *Tibicen* by two characters of the male genitalia, the narrow stick-like uncus, which is spatula-like to (fairly) broad in *Chremistica* and *Tibicen*, and the presence of apical spine-like projections on the theca, which are absent in *Chremistica* and *Tibicen* (Hayashi, 1987).

The uncus shape and the unarmd theca of the Pacific genera *Heteropatria* Jacobi, 1902, *Raiateana* Bouland, 1979 and *Nggeliana* Bouland, 1979 which are not included in Moulds’ cladistic analysis (in press) suggest that these genera are more related to *Chremistica* and *Tibicen* than to *Cryptotympana*.

**Infrageneric relationships in *Chremistica***

Bregman (1985) tentatively subdivided the genus *Chremistica* into four species groups: the *martini* group, the *coronata* group, the *pontianaka* group, and the *tridentigera* group (see introduction). For this revision of the Sundaland species we introduce the new *bimaculata* group for those species of Bregman’s *pontianaka* group which have a conspicuous broad black fascia along the anterior margin of the postclypeus. The 17 species of Sundaland are arranged in three groups: *C. pontianaka* group (5 species), the *C. tridentigera* group (5) and the *C. bimaculata* group (7). The *martini* and *coronata* groups are not represented in Sundaland. The subdivision of the genus proposed here is very preliminary since the 24 *Chremistica* species not occurring in Sundaland have not been studied. A more definitive classification of the genus should be based upon comparative morphological study of representatives of all groups of *Chremistica* and related genera, and proper phylogenetic analysis.

**C. pontianaka group**

The following species are attributed to the *pontianaka* group: *C. pontianaka*, *C. niasica*, *C. hollowayi*, *C. guamusangensis*, and *C. cetacauda*. A possible synapomorphy for the *pontianaka* group is the mediun glabrous area of the postclypeus that narrows ventrally to the 8th pair of black transverse grooves and continues in a semi-oval area of the ground colour at the clypeal suture while it dorsally continues in a median, often semi-elliptic spot of the ground colour at the frontoclypseal suture.

The medial ends of the upper 8-11 pairs of transverse black grooves are connected by a black line, but in *C. cetacauda*, only the upper 0-3 pairs of black grooves are medially connected. A similar feature is found in some species of the *tridentigera* group. The species of the *bimaculata* group have a conspicuous broad black fascia along the anterior margin of the dorsal side of the postclypeus.

**C. bimaculata group**

The following species are attributed to the *bimaculata* group: *C. bimaculata*, *C. malayensis*, *C. brooksi*, *C. nesiotes*, *C. echinaria*, *C. sumatrana* and *C. kecil*. A possible synapomorphy for the species of the *C. bimaculata* group is the conspicuous broad black fascia along the anterior margin of the postclypeus, which is formed by the fusion of the mediodorsal black colouration in the upper 4-5 pairs of transverse grooves. A second possible synapomorphy is found in the unmarked underside of the postclypeus.

**C. tridentigera group**

The following species are attributed to the *tridentigera* group: *C. tridentigera*, *C. biloba*, *C. umbra*, *C. borneensis* and *C. minor*. The species of the *tridentigera* group have arc-shaped claspers, which is almost certainly a synapomorphy for the group. The long lateral pygofer lobes, which are at least 5 times as long as wide and sometimes twisted, are synapomorphic for the species of the *tridentigera* group with exception of *C. borneensis*, which has relatively short lobes. Another possible synapomorphy for the species of the *tridentigera* group is the anteriorly more or less distinctly trilobate median black marking on the vertex which is often narrowly connected with the black colouration around the eyes.

**List of species**

**pontianaka group**

- *pontianaka* (Distant, 1888)
- *niasica* Yaakop & Duffels sp. n.
- *guamusangensi* Salmah & Zaidi, 2002
- *hollowayi* Yaakop & Duffels sp. n.
- *cetacauda* Yaakop & Duffels sp. n.

**bimaculata group**

- *bimaculata* (Olivier, 1790)
- *malayensis* Yaakop & Duffels sp. n.
- *brooksi* Yaakop & Duffels sp. n.
- *nesiotes* Breddin, 1905
- *echinaria* Yaakop & Duffels sp. n.
- *sumatrana* Yaakop & Duffels sp. n.
- *kecil* Salmah & Zaidi, 2002
The genus *Chremistica* is recorded from Madagascar, India and Sri Lanka, continental South East Asia, Taiwan, Philippines, Malayan Peninsula, Sumatra, Borneo and Java, Sulawesi and the Lesser Sunda Islands. The genus *Chremistica* comprises 42 species of which 17 occur in Sundaland (Malayan Peninsula, Sumatra, Borneo, Java) (Metcalf 1963; Duffels & Van der Laan 1985, Bregman 1985; Chou et al. 1997; Boulard 2001b, 2002).

The distribution of the Sundaland species of *Chremistica* is given in table 1 and in species distribution maps (figs. 68-75). The highest number of *Chremistica* species has been recorded from the Malayan Peninsula (8 species), while lower numbers are found in Borneo (7 species), Sumatra (4 species), Java (1 species) and Nias (1 species). Of the 17 Sundaland species, 13 species are island or peninsula endemics and 4 species are more widely distributed. The percentage of island endemics for *Chremistica* is highest in Java (1 species: 100%) and Nias (1: 100%), followed by Sumatra (3: 60%), Borneo (4: 57%), and Malayan Peninsula (4: 50%). Some of the island endemics have very restricted distributions: *C. niasica* is restricted to Nias Island, west of Sumatra, *C. echinaria* is mainly restricted to mountainous areas in Peninsular Malaysia, *C. kecil* has been recorded from one locality, Tasik Chini, in Peninsular Malaysia, and *C. borneensis* has been recorded from Tawau Hills, Sabah, only. None of the four more widely distributed species occur all over Sundaland. Three species, *C. pontianaka*, *C. nesiotes* and *C. minor* occur in the Malayan Peninsula and Borneo. *C. umbrosa* is recorded from the southern part of the Malayan Peninsula, the eastern coastal area of Sumatra, and from Banka Island and various other islands in the southern Strait of Malacca.

### Table 1. Distribution of the species of *Chremistica*.

<table>
<thead>
<tr>
<th>Species</th>
<th>Malayan Peninsula</th>
<th>Borneo</th>
<th>Sumatra</th>
<th>Java</th>
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<td>Sarawak</td>
<td>Sabah</td>
<td>Kalimantan</td>
<td>Brunei</td>
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<td><em>C. pontianaka</em></td>
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<td><em>C. niasica</em></td>
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<td><em>C. guamusangensis</em></td>
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<td><em>C. holowiayi</em></td>
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<td><em>C. cetacauda</em></td>
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<td><em>C. bimaculata</em></td>
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<td><em>C. malayensis</em></td>
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<td><em>C. brooksi</em></td>
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<td><em>C. nesiotes</em></td>
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<td><em>C. echinaria</em></td>
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<td><em>C. sumatrana</em></td>
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<td><em>C. tridentigera</em></td>
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<td><em>C. biloba</em></td>
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<td><em>C. umbrosa</em></td>
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<td><em>C. borneensis</em></td>
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<td><em>C. minor</em></td>
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</tbody>
</table>

| Number of species | 8 | 6 | 5 | 4 | 3 | 5 | 1 |

### tridentigera group
- *tridentigera* Breddin, 1905
- *biloba* Bregman, 1985
- *umbrosa* (Distant, 1904)
- *borneensis* Yaakop & Duffels sp. n.
- *minor* Bregman, 1985

### DISTRIBUTION

The genus *Chremistica* is recorded from Madagascar, India and Sri Lanka, continental South East Asia, Taiwan, Philippines, Malayan Peninsula, Sumatra, Borneo and Java, Sulawesi and the Lesser Sunda Islands. The genus *Chremistica* comprises 42 species of which 17 occur in Sundaland (Malayan Peninsula, Sumatra, Borneo, Java) (Metcalf 1963; Duffels & Van der Laan 1985, Bregman 1985; Chou et al. 1997; Boulard 2001b, 2002).

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### MATERIAL AND METHODS

The institutions listed below are the depositories for the material studied. Abbreviations given are used in this paper.

- **AMNH** American Museum of Natural History, New York
- **BMNH** Natural History Museum, London (former British Museum (Natural History))
- **KBIN** Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel
- **MNKM** Muzium Negara Malaysia, Kuala Lumpur
- **MNP** Muséum National d’Histoire Naturelle, Paris
- **MOLDS** Private collection Mr. M. S. Moulds, Greenwich, Australia
- **MZHF** Zoological Museum, Finnish Museum of Natural History, Helsinki

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Zoologisches Institut und Zoologisches Museum, Universiteit van Nederland

The maps for the species distributions were printed from the 'Biodiversity Database of the Cicadas of South East Asia and the West Pacific' with the programme MapInfo for Power Mac, version 4.03 on maps of ADE-Worldmap version 2.0 vol. 4 Southern Asia & Australia. The localities and other data from the specimen labels in the database are filed in the programme File-Maker Pro 4.0. The information about geographical co-ordinates has been retrieved from the following sources: 'Atlas van Tropisch Nederland' (Anonymous 1938), The Times Atlas of the World (Anonymous 1994), and the GEOnet Names Server of the U.S. Defense Mapping Agency (http://www.nima.mil/gns/html/index.html).

The terminology adopted in this paper for features of the body and the male genitalia is given in figs. 1-3.

**Taxonomic Part**

**Genus Chremistica Stål**

*Cicada* (Chremistica) Stål, 1870; 714 [For further references before 1980 see: Metcalf 1963; Duffels & Van der Laan 1985].


**Diagnosis**

Medium-sized to fairly large cicadas. Head triangular, 0.5-0.6 times as long as distance between eyes; head including eyes distinctly narrower than pronotum and slightly wider than mesonotum. Postclypeus swollen and prominent. Median glabrous area of postclypeus well developed and ventrally narrowing to 7th pair of transverse ridges. Rostrum ochraceous with median black line and with a dark apex reaching middle or hind coxae. Postclypeus and head with black marking. The species of *Chremistica* from Sundaland, except *C. umbrosa*, can be recognized by the similar pattern of black thorax markings.

**Pronotum** with black paramedian oblique fissures which are anteriorly connected with a medially interrupted black fascia along anterior margin of pronotum, and posteriorly connected with an V- or U-shaped, median black mark at anterior margin of pronotum collar; these markings often enclose a median anchor spot. Mesonotum with a pair of paramedian obconical fields, a pair of lateral obconical fields enclosing an elongate spot and a central mesonotal mark often enclosing a pair of small oval spots. Tegmina and wings hyaline, tegmina of the Sundaland species either without infuscations or with only two infuscations at the bases of the 2nd and 3rd apical areas; other species of the genus may have more developed pattern of infuscations at the bases of the apical areas and at the apices of the longitudinal veins of the apical areas. Male operculum 1.2-1.3 times as long as wide; apical margin rounded and usually just not reaching posterior margin of sternite 2. Female operculum reaching to half-length of sternite 2. Tymbal covers large reaching laterally to the margin of the operculum and anteriorly to the metathorax, tightly closing the tymbal cavity. Male abdomen with enlarged tergites 2 and 3; posterior margins of tergites 2 and 3 strongly bent to the posterior. Anterior tergite margins in male and female abdomen with black bands. Male pygofer with a pair of basal lobes and a pair of lateral lobes. Uncus triangular. Clasper well developed with lateral and medial lobes. Aedeagus long and stout. Basal plate convex.

**The type species of Chremistica.**

This paragraph partly relies on an excellent nomenclatural exegesis by Boulard (2001a) on the identities of *Tettigonia viridiss Fabricius, 1803* and *Cicada viridis* sensu Stål, 1869 [nec Fabricius, 1803]. The identity of these species is most relevant for the designation of the type species of the genus *Chremistica*.

*Tettigonia viridiss* Fabricius, 1803 was described from 'America meridionali' with reference to 'Stoll. Cic.I.t.18.fig.100' in Stoll (1788). Fig. 100 in Stoll’s book depicts a green-brown cicada with light-brown head and pronotum with dark brown to black marking, a green mesonotum with black stripes and a light-brown abdomen. This cicada was named ‘De groengerande zingende Cicade’ in Dutch [the singing cicada with green margins] and ‘La Cigale chanteuse à bords verts’ in French, and comes from ‘Surinam’.

However, much confusion about the identity of *Tettigonia viridiss* Fabricius arose when Stål (1869) redescribed this species and explicitly mentioned *Cicada bimaculata* Olivier, 1790 from Java as a synonym of *Cicada viridis* sensu Stål, 1869 [nec Fabricius, 1803]. *Cicada bimaculata* is the latinized name of another species described by Stoll (1788) as ‘De twee-vlak'
Fig. 1. *Chremistica guamuangensis*, body in dorsal view: af, ambient fissure; as, anchor spot; ce, cruciform elevation; cm, central mark; fs, frontoclypeal suture; mga, median glabrous area; lof, lateral oblique fissure; lobf, lateral obconical field; p, pygofer; pobf, paramedian obconical field; pof, paramedian oblique fissure; sas, second abdominal segment.
In Dutch [the two-patched cicada] and ‘La Cigale à deux taches’ in French and depicted in fig. 132. In fact we are dealing with two different species named _Tettigonia viridis_ Fabricius, 1803 and _Cicada viridis_ sensu Stål, 1869 [nec Fabricius, 1803].

_Tettigonia viridis_ Fabricius, 1803 (= ‘De groen-gerande zingende Cicade’ figured by Stoll in fig. 100) is a green cicada from Surinam. The correct name for this species is _Cicada marginata_ Olivier, 1790, since ‘La Cigale chanteuse à bords verts’ was already latinized by Olivier (1790).

_Cicada marginata_ is currently placed in the neotropical genus _Ariasa_ Distant, 1905.

_Cicada viridis_ sensu Stål, 1869 [nec Fabricius, 1803] (= ‘De twee-vlak’ figured by Stoll in fig. 132) is a species from Java with distinct obconical fields on the mesonotum and two patches of white wax on abdominal segment 2. _Cicada bimaculata_ Olivier, 1790 is the correct name for _Cicada viridis_ sensu Stål, 1869 [nec Fabricius, 1803]. _Cicada bimaculata_ is currently placed in the Southeast-Asian genus _Chremistica_.

Stål (1870) established _Chremistica_ as a subgenus of _Cicada_ and accommodated three species in the new subgenus: _Cicada viridis_ sensu Stål, 1869 from Java and two new species from the Philippines: _tagalica_ and _semperi_. Kirkaldy (1907: 305) was the first author who designated the type species of _Chremistica_ in the following phrase: ‘The type of _Chremistica_ is _viridis_ Stål (= _bimaculata_ Ol),....’. Since _C. bimaculata_ (Olivier) from Java is a senior synonym of _Cicada viridis_ sensu Stål, 1869 [nec Fabricius, 1803], _C. bimaculata_ is the type species of the genus _Chremistica_.

**Key to the species of _Chremistica_**

This key has been designed for identification of the males of _Chremistica_ from Sundaland since the female of two species (_C. brooksi_ and _C. cetacea_ adult) are
unknown, and the female of three species (C. minor, C. borneni and C. guamanungenis) are only known from one single specimen. This key is therefore of limited value for the identification of the females.

1. Anterior part of postclypeus with a continuous, broad, black, transverse fascia, formed by fusion of black colouration of upper 4-5 pairs of transverse grooves. Underside of postclypeus, including transverse grooves, unmarked .......................................................... bimaculata group 2
   – Anterior part and underside of postclypeus with two paramedian series of black transverse grooves .......................................................... sumatrana

2. Abdominal tergite 3 with a pair of lateral oval, white pubescent, waxy patches covering anterior four-fifths of lateral parts of tergite. Male genitalia as in figs. 21-22, Java .......................................................... sumatrana
   – Abdominal tergite 3 missing lateral oval, white patches .......................................................... notsumatrana
3. Median part of black band on tergite 2 reaching to posterior margin of tergite. Male genitalia as in figs. 40-41. Sumatra .......................................................... sumatrana
   – Median part of black band on tergite 2 not reaching to posterior margin of tergite .......................................................... kooli

4. Black bands on abdominal tergites 5-6 narrow lateral; black band on tergite 6 covering less than 50% of tergite surface .......................................................... kooli

5. Body length: 23.8-26.3 mm. Medial clasper lobes broadly semi-circular shaped with rounded edges (fig. 32). Southern Thailand, Peninsular Malaysia, Borneo .......................................................... neiosotes
   – Body length: 28.6-34.2 mm. Medial clasper lobes with three, sometimes four or five, narrowly triangular teeth at the tips (fig. 25). Southern Thailand; Peninsular Malaysia .......................................................... malapensis

6. Body length 30.0-34.8 mm. Lateral ridges of unsc swollen and densely covered with bristles. Southern Thailand; Peninsular Malaysia; Borneo; Sumatra .......................................................... echinaria
   – Body length 27.5 mm or less. Lateral ridges of unsc swollen and without bristles .......................................................... kooli

   – Body length: 27.2-27.5 mm. Aedeagus without ventral process. Medial clasper lobe with three narrowly triangular teeth and with jagged posterior margin. Male genitalia as in figs. 29-30. Sumatra .......................................................... brookei

8. Central mesonotal fascia not connected with spots in front of cruciform elevation. Medial and lateral black margins of lateral obconical field often open (fig. 90). Male genitalia as in figs. 56-57. Peninsular Malaysia; Sumatra ............
   – Central mesonotal fascia connected with pair of spots in front of cruciform elevation. Medial and lateral black margins of lateral obconical field continuous .......................................................... umbrosa

9. Lateral oblique fissures on pronotum with broad black line. Clasper arc-shaped (figs. 3 & 48) .......................................................... biloba
   – Lateral oblique fissures on pronotum without broad black line. Clasper not arc-shaped .......................................................... brookei

10. Body length male less than 32 mm. Abdominal segment 3 with lateral white waxy patch. Black marking enclosing ocelli narrowly connected with frontoclypeal suture (width of connection less than distance between lateral ocelli) .......................................................... sumatrana

11. Uncus broad, slightly longer than wide, and tapering into two bluntly triangular short lobes (fig. 52). Borneo .......................................................... biloba
   – Uncus narrow, 3-4 times as long as wide, and slightly narrowing proximad to a very weakly bilobate apical margin (fig. 48). Borneo .......................................................... brookei

12. Medial ends of upper 8-11 pairs of transverse black grooves on postclypeus connected by black line. Aedeagus without ventral process .......................................................... kooli
   – Medial ends of upper 1-3 pairs of transverse black grooves on postclypeus connected by black line; other black grooves not connected. Aedeagus with ventral process (fig. 18). Sumatra .......................................................... cetacauda

13. Body length in males 26.4-38.0 mm. Paramedian oblique fissures on pronotum with broad black line. Tegmina with transverse veins at bases of second and third apical areas lightly infuscated .......................................................... kooli
   – Body length in males 20.1-21.7 mm. Paramedian oblique fissures on pronotum with narrow black line. Tegmina without infuscations. Male genitalia as in figs. 64-65. Peninsular Malaysia, Borneo .......................................................... minor

14. Pronotum with two broad, black irregular fasciae: one in between paramedian and lateral oblique fissures, and another in between lateral oblique fissure and ambient fissure. Male genitalia as in figs. 14-15. Borneo .......................................................... biloba
   – Pronotum without such fasciae .......................................................... kooli

15. Abdominal tergite 3 either with a white pubescent, waxy band along anterior margin or
with a pair of white pubescent, waxy patches covering anterior two-thirds to three-fourths of lateral parts of tergite .......................... 16

- Abdominal tergite 3 densely silvery to coppery hirsute along anterior margin of tergite 3 but without coverage of white wax. Male genitalia as in figs. 4-5. Peninsular Malaysia, Borneo

16. Body length males 26.4-29.8 mm. Median

- U-shaped black mark at anterior margin of pronotum collar connected with black fasciae in paramedian oblique fissures. Nias Island. C. niasica

- U-shaped black mark at anterior margin of pronotum collar not connected with black fasciae in paramedian oblique fissures. Peninsular Malaysia

Chremistica pontianaka group

The Chremistica pontianaka group consists of five species: C. pontianaka, C. niasica, C. guamusangensis, C. hollowayi and C. cetacauda. C. pontianaka has a wide distribution in Peninsular Malaysia, Borneo and Sumatra. C. guamusangensis is endemic to Peninsular Malaysia. C. cetacauda is endemic to Sumatra. C. niasica is endemic to Nias Island, and C. hollowayi is endemic to Borneo.

A possible synapomorphy for the pontianaka and bimaculata groups together is the black marking on the head: the dorsal side of the head is black except the anterior parts of the vertex lobes and supra-antennal plates and a pair of spots of the ground colour between lateral ocelli and eyes. The species of the tridentigera group have an anteriorly trilobate median black marking on the vertex, which is narrowly connected with the black colouration around the eyes.

A possible synapomorphy for the pontianaka group is the glabrous area on the postclypeus that ventrally narrows to the 8th pair of black transverse grooves, except in C. cetacauda, in which only the upper 0-3 pairs of black grooves are medially connected. A similar feature is found in C. minor and C. borneensis of the C. tridentigera group. In two other species of this group, C. tridentigera and C. biloba, the glabrous area on the postclypeus continues in an area of the ground colour at the clypeal suture but the glabrous area is dorsally often separated from the spot at the frontoclypeal suture by a transverse black fascia. C. umbrosa has an open connection between the median glabrous area and the semi-oval spot at the frontoclypeal suture but the postclypeus is totally black below the glabrous area.

Four species of the pontianaka group, C. pontianaka, C. niasica, C. guamusangensis and C. hollowayi have narrow infuscations at the bases of the second and third apical areas of the tegmina. Such infuscations are found in three other Sundaland species: C. tridentigera, C. biloba and C. borneensis. All species of the bimaculata group have unspotted tegmina.

Chremistica pontianaka (Distant, 1888)


Cicada pontianaka, Distant 1888b: 457; Distant, 1890: Pl. V figs. 7a, b; Distant, 1892a: 97; Distant 1892b: xiii; Noouhier 1896: 254; Noouhier & Martin 1904: 179; Kirkaldy 1907: 305; Kirkaldy 1913: 7.

Cicada daeica, Bredlin 1900: 180; Distant 1906b: 41; Moulton 1912: 129; Moulton 1923: 72, 131 (in syn. of Rihana pontianaka) (not examined).

Rihana pontianaka, Distant 1912: 27; Distant 1913: 39; Moulton 1923: 129; 130; Moulton 1925: 434; Moulton 1928: 511; Schmidt 1928: 107; Lallemand 1931: 76; Singh-Pruthi 1925: 190; Pl. XIX figs. 136A, B: Kato 1932: 154, Pl. XXVII fig. 5; Kato 1944: 2.


Lectotype designation

Cicada pontianaka was described after an unknown number of specimens from Pontianak (West Coast, Borneo) deposited in BMNH. This collection contains four syntypes of Cicada pontianaka from Pontianak.

One syntype bearing the identification label ‘Cicada Pontianaka Dist.’ in Distant’s handwriting has been designated lectotype. The specimen of Cicada pontianaka labeled ‘type’ in BMNH comes from Sumatra (Bock collection) and is not a type specimen.

Description

Ground colour of head, pronotum and mesonotum triangle-brown to dark ochraceous, sometimes with greenish tinge; pronotum collar ochraceous, but posterior one-fourth to two-thirds or median part sometimes with greenish tinge. Ventral side of body with lateral bands of waxy white pilosity running from eyes to abdominal segment 8.

Head – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of triangular-shaped spots of the ground colour with
Figs. 4-7. *Chremistica pontianaka.* – 4, male genitalia in ventral view; 5, male genitalia in lateral view; 6, male operculum in ventral view; 7, female operculum in ventral view.
inwardly curled anterior tips between lateral ocelli and eyes; spots sometimes enclosing a black dot. Vertex sparsely covered with short white to coppery hairs. Postclypeus fairly strongly prominent, transverse grooves, medial band and basal part of postclypeus with short white to coppery hairs. Median glabrous area of postclypeus ventrally connected with sometimes narrow, semi-oval area of the ground colour at clypeal suture and dorsally continuing in a median, semi-elliptic, sometimes semi-oval, spot of the ground colour at the frontoclypeal suture. Gena, lorum and antennecyme covered with long white to ground colour at the frontoclypeal suture. Gena, lorum and antennecyme covered with long white to coppery hairs with exception of glabrous keel of antennecyme. Rostrum with black-brown apex reaching just beyond middle coxae.

Thorax. – Pronotum. Black fasciae in paramedian oblique fissures anteriorly connected with medially interrupted black fascia along anterior margin of pronotum, and posteriorly connected with an U-shaped, median black mark that touches the black ambient fascia along anterior margin of pronotum collar; markings enclosing a median anchor spot of the ground colour. Black colouration of ambient fissure laterally widened. Lateral obconical fields reaching to half-length of mesonotum disc. Lateral obconical fields extending to seven-eighths of mesonotum and enclosing a narrow to broad, elongate area, which is sometimes blackish tinged. Central mark often enclosing a pair of small oval spots of the ground colour, basal part of central mark sparsely covered with coppery hairs. Median point of central mark sometimes touching posterior margin of pronotum collar.

Legs. – Coxae pale ochraceous. Fore femora ochraceous with black fascia connecting dark brown spines. Middle and hind femora dark ochraceous with castaneous tinge. Tibiae dark ochraceous, middle and hind tibiae with dark brown annulation at distal ends.

Tegmina and wings. – Tegmina often with bronzy reflection. Basal cell brownish to olivaceous. Transverse veins at bases of second and third apical areas narrowly brownish or black. Venation of tegmina light brownish in basal third, turning dark brown apically. Costal vein castaneous in basal half, apical half black. Wings with light to dark brown venation.

Male operculum (fig. 6). – Castaneous. Basal two-fifths of medial margins slightly overlapping and occasionly narrowly to broadly black or brown-black from base to middle of distal margin. Laterad margin slightly concave, basal half to two-thirds black.

Male abdomen. – Dorsal side dark castaneous to black. Tymbal covers dark brownish laterally turning to light brownish. Black bands along anterior margins of tergites 2-6 reaching medially to three-fourths of segment length, those on tergites 7 and 8 reaching to half of segment length. Dorsal side of abdomen sparsely covered with golden pubescence. Anterior margin of tergites 3 and 7 and whole segment 8 silvery to coppery hirsute. Ventral side of abdomen (dark) brown to black, median part of sternites 2 and 8 often darkened. Sternites sparsely covered with silver hairs, paratergites with dense silver pilosity.

Male genitalia (figs. 4-5). – Pygofer ochraceous, dorsally marked with black. Lateral pygofer lobes dark brown, in ventral view broad, apical part semi-circular (fig. 4), and in lateral view with acutely angled incision between lateral pygofer lobe and lateroventral pygofer margin (fig. 5). Basal pygofer lobes with bluntly triangular apical margins reaching to three-fifths of pygofer length, apical parts of lobes curved inward. Uncus triangular, apical part dark brown. Medial clasper lobes semi-circular-shaped with rounded edges, apical parts of lobes slightly curved inward. Lateral claspers lobes slightly longer, narrower and more oblique than in the other species of this group. Surface of lateral clasper lobes sparsely covered with pale ochraceous short hairs. Basal plates strongly convex. Anal valves sparsely covered with pale ochraceous long hairs.

Female operculum (fig. 7). – Ochraceous. Lateral margin weakly convex, basal half or two-thirds brown-black. Laterodistal corner of operculum rectangular to obtuse. Posterior margin slightly sinuate and distinctly curved towards meracanthus.

Female abdomen. – Dorsal side orange-brown with transverse black bands along anterior margins of tergites 2-7; these bands have a median protrusion reaching to two-thirds of segment length. Tergite 8 with a narrow black band with a large triangular protrusion reaching to two-thirds of tergite length or to posterior tergite margin. Black bands on tergites 2-8 widen laterad. Segment 9 dorsally with a median black fascia, which is broadly connected with a pair of paramedian spots, and ventrally with black fasciae along anterior halves of lower segment margins, which are distally narrowly connected with another pair of black spots. Anterior margin of sternite 3 with median small black dot, anterior margins of sternites 4 to 7 with black-brown bands between spiracles. Paratergites with white to coppery pilosity and anterior sternite margins sparsely covered with white to coppery short hairs.

Measurements (body length 39.8-43.0 mm, n=10; other measurements 31.1-33.8 mm, 29.3-31.8 mm; head width 12.0-13.6 mm, 9.9-11.6; pronotum width 11.2-13.4 mm, 10.6-12.4 mm; tegmen length 39.8-43.0 mm, 30.0-40.5 mm).

Material examined. – 222, 23, 23, 23.

Yaakop et al.: Chremistica in Sundaland
Disturbed forest. Transect disturbed 6. At light, 26.iii.2001, M. A. Schouten, 1' (ZMA) – Borneo, Malaysia, Sabah: Beaufort, Kg. Selangor, 3.iii.1991, Khamis Selamat, 1' (UKM); Beaufort 105 km of Long Pa Sta area: airstrip Long Pasia, 4°24'N 115°43'E, 16.iv.1987, Van Tol & Huismans, at light, 18.20:20.30 h, semicultivated area. 1000m, asl, near disturbed evergreen trop. rainforest, 3' (MNHU); Datum Valley, 9°41'N 117°47'E, 14.iv.1987, 220m, A. H. Kirk-Sprigg, N. M. W. Sabah (Borneo) Expedition, 1' (ZMA), z. 1987.094, Light trap sample roadside, secondary forest, 1' (MNHU); Lembeh Dammu, 25-30.viii.1991, M. S., Zaidi, Mail & Lan, 3', same data but 22-26.viii.1992, Ismael, Sham & Yusuf, 1', 23.viii.1994, Sham, 1', 16.ix.1995, Zaidi, 3' (ZMA); 60 km W of Lahad Datu, Datum Valley Field Centre at junction 5'g, Segama and S. Palum Tambun, 4°58' 117°48'E, at light, 21.i.1987, 18.30-20.30, Clearing nr E trail, edge of un-touched evergr. lowl. rainforest, Leg. van Tol & Huismans, 2' (BMNH); Ibanom, 20.ix.1991, Ferdinand, 1' (UKM); Kota Kinabalu, Bukit Padang, 3.i.1995, Rosminah, 1', same data but 9.iii.1985, Faridah, 1', 1.iv.1987, Sahfoh, 1', 6.s.i.1999, S. R. Sonay, 1', 20.viii.1990, H. K. Chan & Raj, 1' (UKM); Kota Kinabalu, ukms, 10.i.1985, Saritnah D., 1' (UKM), same data but 20.iii.1985, Zuraidah, 1', 3.ii.1987. Han Twai Hin, 1', 3.x.1987, M. Salleh, 2', 12.iv.1997, Nordin Wahid, 1' (UKM); Weston, 20.viii.1986, Shafol, 1' (UKM); Tawau Hill, jungle lodge, 300 m, garden/secondary growth, at light, 25.iii.2001, J. P. & M. J. Duffels, 1' (ZMA); Tawau, Tibow, 5.9.iv.2000, elev. 300m, Noramly Muslim, 29' (ZMA); Tawau Hills Park, 1-3.iv.2000, Noramly Muslim, 1' (UKM); Lahad Datu, Tabin, km 21, 14-16.iii.1998, Nordin, 3' (UKM) – Sarawak: Baram River, 21.x.1979, Ray L. L., 1', same data but 7.x.1920, J. C. Moulton, 1' (ZMA); Bintulu, Taman Hisap Utara, 3.i.1992, Zaidi, 7' (ZMA), same data but 14.vii.1994, Zaidi & Talib, 6', Bintulu, Pekan, 3.ii.1992, Zaidi, 1' (UKM); Miri, 2.8.ii.1993, Salleh & Ismail, 3', (UKM); Bedong, Light House, 1', (ZMA); Kedung, Light House, J. C. Moulton (Sarawak Museum), 22.xii.1915, 5' (ZMA), Kedung, Moulton, 1' (ZMA); Kuching, 3' (BMNH); Sarawak, Max Weber, Borneo Exp. 3' (BMNH); Coll, 1904 v. d. Bergh., Coll. D. Mac Gullavry, 1' (ZMA); Janjai Entomai, 28-29.ii.1992, Zaidi, 10' (UKM); Borneo, Sarawak, 1' (BMNH); Limbang, Mendamit, 18-21.ii.1991, Zaidi, 1' (UKM); Gunung Mulu Nat. Park, Site 14, ii. 2005, Camp 2.5 Mulu, 1000m, 11.461, Lower 1 montane for. MV-canopy/understorey, J. D. Holloway, bcs Mulu Expe- dition, B.M. 1978-206, 5' (BMNH); Sibu, 1-3.ii.1992, Zaidi, 5' (BMNH); Saribas, iii.1923, 1', same data but ix.1923, 1' (ZMA); Kampus UPM, 2-3.ii.1992, Zaidi, 9', same data but 10.x.1992, 8' (UKM); Indonesia: Kalimantan: Bilk Papan, H. F. Harz, 11.2. (BMNH); Kubing, Kec. Ketapang, 80m, 7.xii.1999, 01'06'00'S 110°28'22.8'E, Oil palm plantation near riverine forest, at light, M. Lammertink, 8' (UKM); Pontianak, Bolt, 2' paralatecotypes, some data with label: Rihana pon- tianakстра Dst., 1' paralatecotype (ZMA); Kalimantan Timur, W. of Tanjunggredeh, 9°54'59"N 117°11'14"E, 50-75m, M. Lammertink, Camp '35 Beru, Forest Project, selectively logged Diphocarpus forest, 1' (ZMA); Borneo, East Kalimantan, logging camp Bongang, Tanjung Soke, W. of Gunung Barus, 110°10'05"E 09°56'25"S, leg. Reit Sizer, 12.xii.1999, 1', same data but 10.xi.1999, 2' (ZMA); 12.xii.1999, 7' (ZMA) – Borneo: Borneo, Le Moulvend. via Reinken, Eng. Nr. I, 1957, 2' (ZMA);
Borneo, Breitenstein, 1850, 1♂ (NHMW); Schwane, Borneo, 1♀ (BNHM); Borneo, HE 5329, 5♂ (MZHF); Borneo, Coll. Signoret, 1♂ (NHMW); Borneo, ex. coll. Schulz, Eing, R. 1956, W. Wagner ded., 2♂ (ZMH). — SUMATRA: Sumatra (Bock). Type (error), 1♂ (BMNH); Indraga, Sons Gi Lalab, 14.vii.1900, W. Burchard leg., 1♂ (ZMH). — RIOW: Riouw, D. K. G. Blokzeijl, 1♂ (RMNH). — AMBON: Ambon, Prager, Museum Natura Artis Magistra, 1♂ (ZMA). — JAVA: Java, Peiz, 855, 2♂ (SONW); Java, Muller, 1♂ (BMNH); Aurora, 1884, 1♀ (NHMW).

**Distribution** (fig. 68)

*C. pontianaka* is widespread in Peninsular Malaysia and Borneo (Sabah, Sarawak, Kalimantan). Specimens from Luzon, Philippines (USNM) have tentative-ly been identified as *C. pontianaka*. The occurrence of *C. pontianaka* in Sumatra needs confirmation. The records from Java are doubtful. The records of *C. pontianaka* from the Lesser Sunda Islands and islands east of Wallace’s Line (Moluccas, Ambon, Lombok, Sumbawa, Timur and New Guinea) in Metcalf (1963) are probably based on misidentifications.

**Chremistica niasica** Yaakop & Duffels sp. n.  
(fig. 69, 77)

*Type material.* — 11♂ 3 ♀. Holotype ♀: ‘G. Madjeja / Noord Nias / Mitschke 10.xiii.1993’ (RMNH). — Paratypes: INDONESIA: SUMATRA: NIAS ISLAND: G. Madjeja Noord Nias, Mitschke trim ’95, 3♂ 2♀ (BMNH) 1♂ (ZMA) 1♂ (UKM); Ell[land] [= Island] Nias, E, E. W. G. Schröder, don. 04.1908, 3♂ (BMNH); Nias, Mirela Rudy, Distant-Coll., 1911-383, 1♂ (BMNH); Nias, Kleiweg de Zwaan, 1911, 1♂ (BMNH); M. Nias, Kalim Bungo, 1st sem ’96, H. Mitschke, 1♀ (BMNH); Sumatra, Levick Bequest, 1941-83, 1♂ (BMNH).

**Diagnosis**

*C. niasica* can be separated from *C. pontianaka* by the conspicuous white wax covering the pubescent, anterior two-thirds to three-fourths of lateral parts of tergite 3; the pubescence is also found in *pontianaka* but it is not covered with white wax. The male genitalia of this species are like those in *C. pontianaka*. *C. niasica* (body length in males: 26.4-29.8 mm) is somewhat smaller than *pontianaka* (31.1-33.8 mm).

**Description**

Ground colour of head and thorax dark ochraceous. Ventral side of body with lateral bands of waxy white pilosity running from eyes to abdominal segment 8.

Head. — Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of broadly triangular spots of the ground colour tapering toward posterior supra-antennal plates and occasionally enclosing a black dot. Median glabrous area of postclypeus ventrally connected with, sometimes narrow, semi-oval area of the ground colour at clypeal suture and dorsally continuing in a median, semi-elliptic, sometimes semi-oval area of the ground colour at frontoclypeal suture; some paratypes have a transverse dark line near the 3rd pair of postclypeal transverse ridges. Gena, lorum, and anteclypeus with exception of keel sparsely covered with long silvery hairs. Rostrum reaching just beyond middle coxae.

Thorax. — Pronotum. Black fasciae in paramedian oblique fissures triangularly widened, anteriorly connected with medially interrupted black fascia along anterior margin of pronotum and posteriorly connected with an U-shaped, median black mark that just reaches the black band in the ambient fissure along anterior margin of pronotum collar. Black colouration of ambient fissure laterally widened. Median anchor spot often enclosing a median longitudinal, dark brown, narrow line extending to one-fourth and occasionally to three-fourths of length of spot. Lateral parts of anchor spot sometimes separated from median part and forming oval spots of the ground colour.

Mesonotum. — Paramedian obconical fields reaching to half-length of mesonotum disc. Lateral obconical fields extending to fourth-fifths or seven-eighths of mesonotum and enclosing a large, narrowly to broadly elongate spot. Apical parts of paramedian obconical fields and mediostal margins of lateral obconical fields sometimes connected to anterolateral edges of central mark. Anterior parts of paramedian obconical fields sometimes fused.

Legs. — Marking and colouring as in *pontianaka*.  
Tegmina and wings. — Marking and colouring as in *pontianaka*.

Male operculum. — Pale castaneous. Medial margins slightly overlapping. Black colouration of medial margin extending from base to middle of apical margin. Lateral margins weakly undulate or slightly con-cave with white to coppery pilosity, basal one-fourth to one-third brown.

Male abdomen. — Dorsal side black-brown to brown. Tymbal covers castaneous, laterally often turning to light brownish. Conspicuous, white pubescent, waxy patches cover anterior two-thirds or three-fourths of lateral parts of tergite 3. Median part of anterior margin of tergite 3 sometimes sparsely covered with white pilosity connecting the two lateral patches. Median part of posterior margin of tergite 2 in most specimens orange-brown. Posterior margins of tergites 3-6 with very narrow red-brown band. Lateral parts of anterior margins of tergites 7 and 8 with white to coppery pilosity. Ventral side of abdomen light to dark brown, sternite 8 dark brown.
Anterior parts of sternites and paratergites silvery hirsute.

Male genitalia. – As in C. pontianaka but surface of lateral clasper lobes densely covered with ochraceous short hairs.

Female operculum. – As in pontianaka but lateral margins more convex and densely covered with white hairs.

Female abdomen. – Black bands along anterior margins of tergites 2-4 reach medially to two-thirds of segment length. Tergites 5-8 black with narrow red-ochraceous hind margins, but posterior halves of tergites 7 and 8 often ochraceous. Segment 9 often with variable black marking, occasionally whole segment black. Dorsal side of abdomen compared to silvery hirsute, especially along anterior segment margins. A pair of conspicuous white pubescent, waxy patches cover anterior halves of lateral parts of tergite 3. Ventral side brownish; sternites 4 to 6 with somewhat darkened bands along anterior margins and between pairs of spiracles; sternite 7 with dark brown marking. Paratergites 3-7 waxy silvery hirsute, anterior and lateral parts of sternites silvery hirsute. Black median marking at anterior margin of sternite 3.

Measurements (body length $\delta$ n= 10; other measurements $n=6$ $\delta$ 3 $\varphi$).

- Body length $\delta$ 26.4-29.8 mm, $\varphi$ 23.7-25.3 mm; head width $\delta$ 11.6-12.0 mm, $\varphi$ 10.4-11.4 mm; pronotum width $\delta$ 11.9-12.1 mm, $\varphi$ 10.3-11.9 mm; tegmen length $\delta$ 39.4-43.1 mm, $\varphi$ 37.0-37.6 mm.

Distribution (fig. 69)

This species is probably endemic to Nias Island, west of Sumatra. The specimen labeled ‘Sumatra’ probably also comes from Nias Island.

Chremistica guamusangensis Salmah & Zaidi, 2002 figs. 1, 8-13, 69, 78


Diagnosis

This species resembles C. pontianaka but can be distinguished by the marking on the pronotum: the median U-shaped black mark at the anterior margin of the pronotum collar is not connected with the black paramedian oblique fissures, while the black median mark and the black paramedian fissures are fused in C. pontianaka. C. guamusangensis (body length in males: 34.4-7-38.0 mm) is also slightly larger than C. pontianaka (31.1-33.8 mm). The males of C. guamusangensis have a characteristic, white pubescent, waxy band along the anterior margin of abdominal tergite 3; this band is medially narrow or interrupted and widens laterally to two-thirds of segment length. C. pontianaka has a similar white pubescence along anterior margin of tergite 3 but this is not covered by white wax.

Description

Ground colour of head and thorax dark yellow to ochraceous, occasionally orange-brown to dark ochraceous, pronotum collar often with greenish tinge. Ventral side of body with lateral bands of waxy white pilosity running from eyes to abdominal segment 8.

Head. – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of more or less broadly triangular, spots of the ground colour, enclosing a brown dot, between lateral ocelli and eyes. Anterior angle of spot separated by a very narrow black line from a curled tip that reaches to half the distance between posterior margin of head and anterior margin of supra-antennal plates. Vertex sparsely covered with short golden hairs. Postclypeus prominent. Median glabrous area of postclypeus ventrally narrowly connected with semi-oval area of the ground colour at clypeal suture and dorsally continuing in a median, semi-oval or triangular spot of the ground colour at frontoclypeal suture. Gena, lorum, and anteclypeus with exception of keel densely covered with long white to coppery short hairs. Rostrum with black apex just reaching anterior margin of hind coxae.

Thorax. – Pronotum. Black fasciae in paramedian oblique fissures anteriorly connected with medially interrupted black fascia along anterior margin of pronotum. Median black mark at anterior margin of pronotum collar either V- or U-shaped or reduced to a pair of juxtaposed black spots; median mark not connected with black fasciae in paramedian oblique fissures. Black colouration of ambient fissure laterally widened.

Mesonotum. – Paramedian obconical fields reaching to half-length of mesonotum disc. Lateral obconical fields extending to seven-eighths of mesonotum disc and enclosing a broadly elongate spot of the ground colour. Central mark enclosing a pair of fairly large, oval spots of the ground colour.

Legs. – Ochraceous. Fore femora with black fascia connecting the black spines. Dark brown annulation at distal ends of middle and hind tibiae.

Tegmina and wings. – As in pontianaka but basal half of costal vein castaneous and apical half black. Wings with light to dark brown venation.

Male operculum (fig. 10). – Basal two-fifths to three-fourths of medial margins slightly overlapping, basal one-fourth of medial margin sometimes black. Lateral margin weakly undulate or slightly concave,
Figs. 8-11. *Chremistica guamusangensis*. – 8, male genitalia in ventral view; Gua Musang; 9, male genitalia in lateral view; Gua Musang; 10, male opercula in ventral view; 11, female operculum in ventral view.
with white to coppery pilosity, basal third brown.

Male abdomen. – Dorsal side dark castaneous to black. Anterior margin of tergite 3 with conspicuous white pubescent, waxy transverse band; the band is medially very narrow or interrupted and widens laterad to two-thirds of segment length. Anterior margins of tergites 7 and 8 densely covered with short white hairs. Ventral side brown to black. Sternite 2, posterior half or one-third of sternite 7 and medial and posterior part of sternite 8 darkened. Anterior sternite margins covered with coppery to white hairs; paratergites with a more dense pilosity.

Male genitalia (figs. 8-9). – Pygofer ochraceous, dorsally marked with black. Lateral pygofer lobes dark brown, in ventral view broad, apical part semicircular, in lateral view with acutely angled incision between lateral margin of pygofer lobe and lateroventral pygofer margin. Basal pygofer lobes with bluntly triangular apex reaching to half of pygofer length, apical parts of lobes curved inward. Uncus broadly triangular, apical part dark brown. Claspers brown. Medial clasper lobes very variable in shape (see the paragraph on variability following the description). Lateral clasper lobes covered with pale ochraceous hairs. Basal plate strongly convex. Anal valves with sparse pale ochraceous long hairs.

Female operculum (fig. 11). – Colouring as in pontianaka, but lateral margin more convex and covered with waxy white pilosity.

Female abdomen. – Brownish. Black bands along anterior margins of tergites 2-6 reaching medially to half or two-thirds of segment length; median part of distal border of black band on anterior tergite 2 forming a small black protrusion. Black bands on tergites 7 and 8 reaching to one-fourth of segment length. Anterior tergite margins sparsely covered with golden pubescence. Anterolateral parts of tergites 3, 7 and 8 covered with white hairs. Anterior half of segment 9 dorsally black, but the black colour extends medially to the caudal dorsal beak; basal parts of
segment 9 along lower segment margins somewhat dark brown. Lateral parts of sternites densely covered with waxy white hairs.

Measurements (n=10): 1. body length \( \approx \) 34.8-38.0 mm; \( \hat{\varphi} \) 30.8 mm; head width \( \approx \) 13.0-14.0 mm; \( \hat{\varphi} \) 12.7 mm; pronotum width \( \approx \) 13.7-15.1 mm; \( \hat{\varphi} \) 13.1 mm; tegmen length 46.4-50.2 mm; \( \hat{\varphi} \) 41.2 mm.

Variability. – The medial clasper lobes are very variable in shape. Three types can be recognized: (1) bluntly rectangular with straight, oblique lateral margin and inwardly curved apical part (fig. 9); (2) bluntly triangular with apical part of lobe weakly curved inward and pointing lateral, and with tip of lobe strongly angular; (3) sharply triangular with apical part of lobe strongly curved inward and pointing lateral (fig. 12), posterior margin of lobe irregular and tip of lobe weakly angular. These differently shaped medial clasper lobes are found in specimens collected in the same locality and on the same day; the specimens do not differ in other morphological characters.

Material examined. – 123 specimens, Malaysia: Peninsular Malaysia: Kelantan: Gua Musang, 19-22.i.1994, Zaidi and Talib; 3\( \hat{\varphi} \) 1\( \varphi \) paratypes 13\( \varphi \) (UKM), same data; Zaidi, Ruslan and Saiful; 5\( \varphi \) (UKM); Gua Musang, Mendrop, 5-8.i.1992, Zaidi, Ruslan and Ismail; 2\( \varphi \) (UKM); Gua Musang, in the town, 10-15.iii.1999, J. P. and M. J. Duffels; M. Y. Ruslan and M. Zaidi; 10-15.iii.1999, 5\( \varphi \) (ZMA). – Kedah: Langkawi, Lubuk Semilang, 5-8.i.1992, Ruslan, Ismail and Zabidi; 1\( \varphi \) (UKM); Temenggor Stauee, 2.i.1992, leg. Jäch (20); 2\( \varphi \) (NHMW). – Pahang: Bentong, Camang, 8-9.i.1992, Zaidi and Ruslan; 1\( \varphi \) (UKM); Cameron Highlands, Tanah Rata, 2.i.1992, Ruslan; 3\( \varphi \) (UKM); Cameron Highlands, Tanah Rata, 2.i.1992, Zaidi, Ruslan, and Ismail; 4\( \varphi \), same data but 8.i.1992, 3\( \varphi \) (UKM); Cameron Highland, 15-16.i.1990, Salleh and Ismail; 7\( \varphi \) (UKM); Cameron Highland, 15-16.i.1990, Ruslan and Ismail; 1\( \varphi \) paratype (UKM), same data but 14-16.i.1992; Zabidi; 3\( \varphi \) (UKM); Cameron Highland, 2.i.1972; B. M. 1973, 1\( \varphi \) (BMNH); Cameron Highland, Tanah Rata, 8.i.1948, H. T. Chipden, Ex F.M.S. Museum. B. M. 1955-354, 1\( \varphi \) (BMNH); Tanah Rata, near Cameron Highlands, 1.i.1970, S. Suzuki leg., 1\( \varphi \) (Moulds); Cameron Highland, Tanah Rata, 2.i.1978, M. Umano leg., 1\( \varphi \) (Moulds); Cameron Highland, Kg. Raja, 3.i.1974, D. B. Kurttak, 1\( \varphi \) (MNH); Cameron Highlands, 10-11.i.1997, Ismail and Muzamil; 3\( \varphi \) paratypes 8\( \varphi \) (UKM); Merapoh, 10-11.i.1997, Ismail and Muzamil; 1\( \varphi \) paratype (UKM); Taman Negara NP, Kuala Jurum, E of Merapoh, 4-9°N 102°09’E, edge primary rainforest (near dormitory), at light, 13-15.iii.1999, J. P. and M. J. Duffels; M. Zaidi and M. Y. Ruslan; 2\( \varphi \) (ZMA) – PERAK: Gopeng K. Sungai Iek, Badrol, 1\( \varphi \) paratype 7\( \varphi \) (UKM); Kwala Kangsar, ILII.1900, B. Jachan vend., 15.vii.1900, 1\( \varphi \) (ZMA). – SELANGOR: Kajang, 12.ii.1994, Yong Yin Yee, 1\( \varphi \) (UKM). – NEGERI SEMBILAN: Gemenchek, 11.xi.1996, Ismail and Ruslan, 1\( \varphi \) (UKM); Fraser Hill, A. S. Cotter, 2.i.1930, 1\( \varphi \) (BMNH). – SARAWAK: Bintulu, 14.x.1994, Zaidi and Talib; 1\( \varphi \) paratype 4\( \varphi \) (UKM). – INDONESIA: SUMATRA: Medan 1909, Van Loghem, 1\( \varphi \) (BMNH).

Distribution (fig. 69) – This species is probably endemic to Peninsular Malaysia. The records of this species from Sarawak and Sumatra need confirmation.

Chremistica hollowayi Yaakop & Duffels sp. n. (figs. 14-17, 70, 79)


Diagnosis

C. hollowayi can be distinguished by the presence of two pairs of pronotal fasciae that are not found in any other species of the genus: a pair of short, fairly broad, black irregular fasciae in between paramedian and lateral oblique fissures, and a pair of long, oblique, broadly black irregular fasciae in between lateral oblique fissure and lateral part of ambiant fissure. This species also has some unique features in the male genitalia: very weakly convex lateral pygofer lobes and a very weakly concave incuration beyond the pygofer lobe instead of a more or less deep incision as found in other Chremistica species.

Description

Ground colour of head, pronotum and mesonotum dark yellow to dark ochreous, sometimes with greenish tinge.

Head. – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of rounded triangular spots of the ground colour, with slightly inwardly curled anterior tips, between lateral ocelli and eyes. Vertex sparsely covered with short coccypy hairs. Postclypeus prominent. Median glabrous area of postclypeus ventrally connected with semi-oval area of the ground colour at clypeal suture and dorsally continuing in a median, semi-oval spot of the ground colour at frontoclypeal suture. Transverse grooves black with white to coccypy pubescence. Gena, lorum, and anteclypeus with exception of keel black and densely covered with yellowish to coccypy pubescence. Rostrum with black apex just reaching hind coxae.

Thorax. – Pronotum. Black fasciae in paramedian oblique fissures anteriorly connected with medially interrupted black fascia along anterior margin of pronotum, and posteriorly connected with V-shaped, median black mark that touches the black
Figs. 14-17. *Chremistica hollowayi*. – 14, male genitalia in ventral view; 15, male genitalia in lateral view; 16, male opercula in ventral view; 17, female operculum in ventral view.
ambient fissure at anterior margin of pronotum collar. Median anchor spot of the ground colour enclosing a longitudinal median black streak which is one-fourth to three-fourths as long as the spot. A fairly broad, irregular black fascia with medially curved tip, in between paramedian and lateral oblique fissures, connected to black anterior pronotum ridge and about one-third to half as long as lateral oblique fissure. A long, oblique, broadly black irregular fascia, in between lateral oblique fissure and lateral part of ambient fissure, running parallel to lateral fissure from anterior ridge of pronotum to black ambient fissure.

Mesonotum. – Paramedian obconical fields reaching to about half-length of mesonotum disc. Lateral obconical fields enclosing a fairly broad to very narrow, elongate spot of the ground colour. Basal part of central mark sparsely covered with white to coppery hairs.

Legs. – Ochraceous, sometimes dark ochraceous. Fore femora with somewhat darkened fascia connecting brownish black spines. Distal ends of femora darkened.

Tegmina and wings. – Tegmina often with bronzy reflection. Basal cell dark olivaceous to olivaceous. Transverse veins at bases of second and third apical areas narrowly brownish or black. Venation of tegmina brown in basal third, turning dark brown apically. Costal vein pale ochraceous in basal half, apical half dark brown. Venation of wings brown to dark brown.

Male operculum (fig. 16). – Ochraceous. Basal part with dark brown colouration extending medially to two-thirds of medial margin and laterally to about half-length of lateral margin. Medial margins slightly overlapping. Lateral margin densely covered with coppery hairs.

Male abdomen. – Dorsal side of abdomen black; lateral one-third to two-thirds of tymbal covers light ochraceous. Dorsal side of abdomen sparsely covered with silvery or golden pubescence but more densely pubescent along anterior margins and on lateral parts of segments. Ventral side of abdomen ochraceous to dark brown, and densely covered with short golden hairs.

Male genitalia (figs. 14–15). – Pygofer ochraceous, dorsally marked with black. The lateroventral pygofer margin forms a very weakly convex lateral pygofer lobe and a very weakly concave incurvation beyond the pygofer lobe instead of a more or less deep incision as found in other *Chremistica* species. Basal pygofer lobes reaching beyond lateral lobes of pygofer to two-fifths of pygofer length, apical parts of lobes widened and curved inward. Uncus dark brown and bluntly triangular-shaped in ventral view. Medial clasper lobe castaneous, narrow, with acute, strongly incurved apex. Lateral clasper lobe ochraceous, and slightly bulbous. Basal plates strongly convex. Aedeagus ochraceous to dark brown.

Female operculum (fig. 17). – Ochraceous. Lateral margin straight, basal three-fourths brown-black. Laterodistal corner of operculum obtuse. Posterior margin straight and distinctly curved towards meralcanthus.

Female abdomen. – Tergites 2-8 black and covered with golden pubescence. Segment 9 dorsally with a median M-shaped black marking that is broadly connected with black fasciae along lower segment margins. Ventral side of abdomen black and densely covered with long coppery hairs. Stermites 3 to 7 with a pair of broad paramedian, black-brown marks reaching from anterior margin to three-fourths of sternite length.

Measurements (n=3:♂ 2♀). Body length ♂ 30.5-33.6 mm, ♀ 29.7-29.9 mm; head width ♂ 12.3-12.9 mm, ♀ 12.3-12.6 mm; pronotum width ♂ 11.6-13.0 mm, ♀ 9.7-12.1 mm; tegmen length ♂ 42.4-45.0 mm, ♀ 41.5-43.3 mm.

Distribution (fig. 70). *C. hollowayi* is recorded from Borneo Island (Sabah, Sarawak and Brunei).

Etymology

This species is named in honour of Dr. Jeremy Holloway, who collected the male specimens of the type series.

*Chremistica cetacauda* Yaakop & Duffels sp. n. (figs. 18-20, 70, 80)


Diagnosis

*Ch. cetacauda* has nine pairs of black fasciae in the transverse grooves on the ventral side of the postclypeus. A black transverse line connects the medial ends of the black fasciae in the upper three pairs of grooves; the medial ends of the other black fasciae are not connected. In the other species of the *pontianaka* group a narrow black line connects the medial ends of the upper 8-11 black fasciae in the grooves of each side.

Description of male

Ground colour of head, pronotum and mesonotum yellow to ochraceous, but pronotum collar of the paratype with greenish tinge.

Head. – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of obliquely triangular spots of the ground colour...
Figs. 18-20. *Chremistica cetacea*. – 18, male genitalia in ventral view; 19, male genitalia in lateral view; 20, male opercula in ventral view.
between lateral ocelli and eyes. Vertex sparsely covered with short, white to coppery, hairs. Postclypeus weakly prominent. Median glabrous area of postclypeus separated from median, triangular spot of the ground colour at frontoclypeal suture by a black transverse line that connects medial ends of upper three pairs of black grooves. Next five pairs of transverse grooves with long black fasciae, which are not connected at their medial ends; lowest pair of fasciae very short and connected with a pair of lateral black marks at clypeal suture. Transverse grooves and basal part of postclypeus covered with silvery pubescence. Anterior half of gena, posterior half of lorum, and anteclypeus with exception of keel, black. Gena, lorum and anteclypeus with exception of keel sparsely covered with long white hairs. Rostrum with dark brown apex just reaching hind coxae.

Thorax. – Pronotum. Black fasciae in paramedian oblique fissures connected anteriorly with medially interrupted black fascia along anterior margin of pronotum, and posteriorly with an U-shaped, median black mark that touches black ambient fissure along anterior margin of pronotum collar; these black markings enclose a median anchor spot of the ground colour. Black paramedian oblique fissures enclose narrow, oblique spots of the ground colour.

Mesonotum. – Paramedian obconical fields reaching to about half-length of mesonotum disc. Lateral obconical fields enclosing a (very) narrow elongate spot of the ground colour. Basal part of central mark sparsely covered with coppery short hairs.

Legs. – Ochraceous, with greenish tinge in holotype. Spines on fore femora yellow-brown.

Tegmina and wings. – Basal cell pale olivaceous. Venation of tegmina light brownish in basal third, remaining venation dark brown. Costal vein castaneous in basal half, apical half brown-black. Venation of wings light to dark brown.


Abdomen. – Orange-yellow. Medial corners of tymbal covers dark brown, paratype with anterior fourth of cover black. Tergites 2-9 with black bands along anterior segment margins. Black band on tergite 2, with median protrusion in the holotype, reaching to two-thirds of segment length; black band on tergite 3 reaches to four-fifths of segment length, and those on tergites 4 to 8 reach medially to half of the segment length and widen laterally. Dorsal side of abdomen sparsely covered with golden pubescence. Ventral side of abdomen brownish ochraceous and covered with silvery pubescence.

Genitalia (figs. 18-19). – Pygofer oochraceous, dorsally with large brown mark, anal valves and uncus brown; aedeagal ventral process reddish brown. Lateral pygofer lobe in ventral view gradually widening and convexly curved to apical margin of pygofer lobe that is slightly inwardly curved and forms a right-angled corner with laterodistal pygofer margin; there is no incision between pygofer lobe and pygofer margin. Basal pygofer lobes reaching to two-fifths of pygofer length. Uncus triangular and curved upward, lateral ridges slightly swollen. Medial clasper lobe triangular-shaped with tip pointing proximad. Medial margin of medial clasper lobes convex. Lateral clasper lobe situated behind medial lobe. Aedeagus long and stout, with ventral process shaped like the tail of a whale. Process connected to aedeagus by narrow stalk, apical part of process semi-spherical with strongly concave and outwardly curved posterior margin. Basal plate strongly convex.

Measurements (n=2). – Body length 25.2-27.0 mm; head width 10.9-11.7 mm; pronotum width 10.4-11.5 mm; tegmen length 34.5-38.5 mm.

Distribution (fig. 70)

This species is probably restricted to Sumatra Island.

Etymology

This species is characterized by the ventral process of the aedeagus which is shaped like the tail of a whale. The name ‘cetacauda’ is composed of two parts ‘ceta’ derived from Cetacea (Latin for whales) and ‘cauda’ (Latin for tail).

Chremistica bimaculata group

This group consists of seven species: C. bimaculata (Olivier), C. brooksi Yaakop & Duffels sp. n., C. echinaria Yaakop & Duffels sp. n., C. kecil Salmah & Zaidi, C. malayensis Yaakop & Duffels sp. n., C. nesiotes Bredain and C. sumatrana Yaakop & Duffels sp. n. A possible synapomorphy for the species of C. bimaculata group is the conspicuous, broad black, transverse fascia, along the anterior margin of the postclypeus, which is formed by fusion of black colouration of upper 4-5 pairs of transverse grooves. A second possible synapomorphy is found in the unmarked underside of the postclypeus.

The bimaculata group can be divided into two subgroups: C. bimaculata, C. malayensis and brooksi with both, fairly long medial clasper lobes, tapering proximad and armed with triangular teeth, and broad and distinct lateral pygofer lobes, and C. nesiotes, C. echinaria and C. sumatrana with semispherical medial clasper lobes without armature and with less distinct lateral pygofer lobes. C. kecil has unarmed triangular median clasper lobes.

C. bimaculata is endemic to Java. C. malayensis is endemic to the central part of Peninsular Malaysia.
C. brooksi is endemic to Sumatra, and C. nesiotes has a wide distribution in South Thailand, Peninsular Malaysia, Singapore, and Borneo. C. echinaria is restricted to mountainous areas of Peninsular Malaysia, C. sumatrana is endemic to Sumatra island, and C. kecil is endemic to Peninsular Malaysia.

Chremistica bimaculata (Olivier, 1790) (figs. 21-24, 71, 81)

[Cicada bimaculata]; Stoll 1788: 91, Pl. XXIV Fig. 132; Olivier 1797; Pl.113, Fig. 7.

Figs. 21-24. Chremistica bimaculata. – 21, male genitalia in ventral view; 22, male genitalia in lateral view; 23, male opercula in ventral view; 24, female operculum in ventral view.
Cicada bimaculata, Germar 1821: 97; Germar: 1830: 7; Germar: 1834: 61, 71
Cicada bimaculata; Burmeister 1835: 182; Stål 1866: 171
(= [Cicada] atrospinosus: Guérin-Méneville; Kirby 1892: 390 (= [Cicada] atrospinosus: Guérin-Méneville)
Cicada atrospinosus Guérin-Méneville 1838: 182; Walker 1858: 30; Kirkaldy 1899: 391 (in syn. of [Cicada] bimaculata Olivier).
[Cicada] bimaculata, Stål, 1869: 5 (in syn. of Cicada viridis Stål [nef Fabricius, 1803]).
Cicada viridis [nef Fabricius, 1803]; Distant 1892a: 98, pl. XII, figs. 19, 19a-b (= Cicada bimaculata Olivier; = Cicada atrospinosus Guérin-Méneville).
Rhimna bimaculata; Distant 1906b: 33; Distant 1909: 208; Distant 1912: 27 (= Tettigonia viridis Fabricius, 1803 [error]; = Cicada atrospinosus Guérin-Méneville).
Rhimna bimaculata; Distant 1917: 101; Karo 1932: 154; Karo 1934: pl. 62, fig. 16; Mouhon 1923: 129, 131, 132.
Chremistica bimaculata; Metcalf 1963: 170-172; Bregman 1985: 39.

Not: Boulard 2002: 55-58, figs. 14-15 (this record of C. bimaculata from Thailand is based upon misidentification; the male genitalia of the supposed bimaculata differ in several respects from the true bimaculata from Java).

Diagnosis

Olivier’s description (1790) and figure (1797) of the cicada named ‘La cigale a deux taches’ in French and ‘Cicada bimaculata’ in Latin were copied from Stoll (1788). Olivier’s description of Cicada bimaculata does not deviate in any detail from Stoll’s description of ‘De Twee-vlak’ in Dutch or ‘La Cigale a deux taches’ in French (p. 91, pl. XXIV fig. 132). This makes it most likely that Olivier did not study any material of Cicada bimaculata but used Stoll’s work as a basis for the description of this species.

C. bimaculata is easily distinguished from the other species in C. bimaculata group by a pair of conspicuous, white pubescent, waxy oval patches covering anterior four-fifths of lateral parts of abdominal tergite 3.

Description

Ground colour of head and thorax ochraceous, sometimes with greenish tinge. Ventral side of body with lateral bands of waxy pilosity running from eyes to segment 8.

Head. – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of triangular to conical spots of the ground colour enclosing a narrow black dot, between lateral ocelli and eyes; spots with narrow, inwardly curled anterior tip that occasionally forms a separate small spot. Vertex covered with coppery short hairs. Postclypeus prominent. Median dorsal spot of postclypeus at frontoclypeal suture semi-elliptic, sometimes broadly triangular and occasionally truncate. Anterior two-thirds of gena, posterior half of lorum and a pair of spots on anteclypeus black. Gena, lorum and ante-clypeus with exception of keel densely covered with yellow to white long hairs. Rostrum with black-brown apex just reaching hind coxae.

Thorax. – Pronotum. Black fasciae in paramedian oblique fissures anteriorly connected with medially interrupted black fascia along anterior margin of pronotum, and posteriorly with an U-shaped, median black mark that touches the black ambient fissure along anterior margin of pronotum collar; markings enclosing a median anchor spot of the ground colour. Black fasciae in paramedian oblique fissures sometimes enclosing a long narrow spot of the ground colour.

Mesonotum. – Paramedian obconical fields extending to half and sometimes three-fourths of mesonotum disc length. Lateral obconical fields enclosing a very narrow to narrow, elongate spot of the ground colour. Central mark sometimes enclosing a pair of spots of the ground colour, basal part of central mark sparsely covered with coppery short hairs. Median point of central mark sometimes touching posterior margin of pronotum collar. Anterior branches of cruciformal elevation with a small apical black spot.

Legs. – Pale ochraceous, sometimes orange-brown. Fore femora with two long, pale ochraceous to occasionally yellowish-brown, spines with dark-brown tips and a very small triangular spine distally of the most distal long spine.

Tegmina and wings. – Basal cell of tegmina pale ochraceous or greenish. Costal vein dark ochraceous sometimes greenish in basal half and turning dark brown or castaneous apically. Venation ochraceous, sometimes olivaceous, in basal third, turning dark brown apically.

Male operculum (fig. 23). – Light brownish and sometimes orange-brown. Basal two-fifths, or sometimes three-fifths, of medial margins slightly overlapping; in one specimen the medial margins don’t overlap. Lateral margin straight and slightly oblique.

Male abdomen. – Ochraceous to light brownish. Black bands along anterior segment margins medially about as wide as laterally. Tymbal covers entirely or only medially brown-black. Black bands on tergites 2 and 3 reaching to three-fourths of segment length. A pair of conspicuous white pubescent, waxy oval patches covers anterior four-fifths of lateral parts of tergite 3. Black bands on tergites 4 to 6 reaching to half or three-fourths of segment length, those on
tered with silvery to golden pubescence. Ventral side of abdomen pale ocheraceous and sometimes dark brown. Posterior sternite margins with somewhat darkened or dark brown bands. Median part of sternite 2 and whole of sternite 8 black to dark brown; median part of other sternites sometimes dark brown. Sternites and paratergites densely covered with silvery to golden pubescence. Ventral side of abdomen pale ochraceous and sometimes densely, covered with coppery to golden brown bands. Anterior sternite margins somewhat darkened, occasionally with dark to one-fourth or half of length. Posterior sternite margins three-fourths of length, and those on tergites 7 and 8 to one-fourth or half of length. Posterior sternite margins somewhat darkened, occasionally with dark brown bands. Anterior sternite margins sparsely, sometimes densely, covered with coppery to golden pubescence; lateral parts of sternites densely pubescent.

Measurements (n=10♂, 1♀). – Body length ♂ 24.1-27.6 mm, ♀ 22.4-25.1 mm; head width ♂ 10.3-11.5 mm, ♀ 9.7-10.1 mm; pronotum width ♂ 9.6-11.6 mm, ♀ 9.0-9.7 mm; tegmen length ♂ 31.5-38.5 mm, ♀ 31.2-32.2 mm.

Material examined. – 15♂ 10♀, INDONESIA: JAVA: Java, Bimaculata ? Oliv., Encycl. p. 756, German, p. 61, Stoll. p. 132 (handwritten) "Peut-etre le type? Michel Boulard det. 1981 [this specimen is not the type], 1♂ (MNHN); Batavia, W. C. v. Heurn, 1931-38, 2♂ (RMNH); Buitenzorg, ca. vi.1927, Frangenheim, 1♀ (ZMA); Java, Coll. Signoret, 1♀ (NHMW); Java, M. C. Piepers, 1♀ (RMNH); Salatiga, 10.xi.1908, v. d. V, 1♀ (RMNH); Noesa Kembangan, xi.1910, F. C. Drescher "dupla", 1♂ (UKM), same data but 13.xi.1927, 1♂ (UKM), ii.1914, coll. Dr. D. MacGillivray, 1♀ (UKM); Salatiga, 10-16, 1♀ (ZMA); Tjilatjap, Drescher, 17.xii.1926, coll. Dr. D. MacGillivray, 1♀ (ZMA), same data but ii.1913, 1♀ (ZMA), xii.1913, 1♀ (ZMA), v.1913, 1♀ (ZMA), i.1915, 1♂ 1♀ (ZMA), ii.1915, 1♀ (ZMA), xi.1915, 1♀ (ZMA); Res. Semparg, Gedangan, 40 m, Fr. A. Th. H. Verbeek. No. IV., 1♀ (RMNH); Tangi, Priok, Dr. P. Buitendyk, 5.xiii.1912, 1♂ (RMNH); Without locality: Distigma de Haan [probably ms name], 1♀ (RMNH); tangkap di lampoe (Gazling) [caught at lamp], 2.x.39, Ir. P. A. Blijdorp, 1♂ (RMNH).

Distribution (fig. 71)

C. bimaculata is probably endemic to Java. In the large number of Chremistica studied for this revision we have not seen a specimen of C. bimaculata from other islands or the mainland of South East Asia. The records from Cambodia, Malay Peninsula and Indo-China (Moulton 1923) and several other localities listed by Metcalf (1963) are probably based upon misidentifications. The recent record of C. bimaculata from Thailand by Boulard (2002) is also based upon misidentification, the male genitalia of the supposed bimaculata (Boulard 2002: figs. 14-15) differ in several respects from the true bimaculata from Java. In recent years, C. bimaculata has been recorded repeatedly from Sabah, Borneo (Zaidi, Ruslan & Azman 1999, 2000; Zaidi, Noramly & Ruslan 2000a, b); a part of this material was studied by us and proved to belong to C. neinerti.

Chremistica malayensis Yaakop & Duffels sp. n. (figs. 25-28, 71, 82)


Diagnosis

*C. malayensis* (body length males: 28.6-34.2 mm) is only slightly smaller than *C. echinaria* (30.0-34.8 mm), but the two species are distinctly larger than the other species of the *C. bimaculata* group. *C. malayensis* differs from *C. echinaria* in the black bands on tergites 3 to 6 which distinctly narrow laterad to separate from *C. malayensis* and *C. echinaria*. The most reliable characters to separate *C. malayensis* from *C. echinaria* are found in the very characteristic male genitalia.

Description

Ground colour of body orange-brown to dark ochraceous, pronotum collar sometimes with greenish tinge.

Head. – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of conical, spots of the ground colour between lateral ocelli and eyes; spots enclosing a narrow, triangular, black dot which occasionally divides the spot in two. Vertex sparsely covered with short silvery hairs. Postclypeus prominent. Transverse grooves, medial band and basal part of postclypeus covered with yellow to coppery short hairs. Median dorsal spot of the ground colour at frontoclypeal suture often semi-elliptic and sometimes semi-oval. Anterior two-thirds of gena black. Gena, lorum and anteclypeus with exception of keel sparsely covered with yellowish short. Rostrum with dark brown apex just passing middle coxae.

Thorax. – Pronotum. Black fasciae in paramedian oblique fissures triangularly widened, sometimes enclosing a long narrow spot, anteriorly connected with medially interrupted black fascia along anterior margin of pronotum, and posteriorly connected with an V-shaped, median black mark that touches the black ambient fissure along anterior margin of pronotum collar. Lateral corner of median anchor spot, bordered by the median V-shaped mark and separated from the rest of the spot by a transverse black line. Lateral parts of anchor spot sometimes forming separate, narrow, transverse, oval spots.

Mesonotum. – Paramedian obconical fields extending to half-length of mesonotum disc. Lateral obconical fields extending to seven-eighths of mesonotum disc. Tergites and enclosing a (very) narrow to fairly broad, elongate spot of the ground colour. Basal part of central margin sparsely covered with golden to coppery short hairs. Median point of central mark sometimes reaching posterior margin of pronotum collar.

Legs. – Pale orange to ochraceous. Fore femora with somewhat darkened fascia connecting brown spurite of middles and hind legs with brown annulation at distal ends.


Male operculum (fig. 27). – Pale red-orange to ochraceous and sometimes dark ochraceous, sparsely covered with silvery to golden pubescence. Basal two-thirds of medial margins slightly overlapping. Lateral margin straight, oblique and curled upward, and brownish at base.

Male abdomen. – Medial corners of tymbal covers brown to dark brownish. Tergite 1 with a pair of conspicuous, pubescent, waxy white dots laterodistally of posterior branches of cruciform elevation. Tergites 2-4 with black bands along anterior margins medially reaching to three-fourths of segment length; bands on tergites 3 and 4 narrowing laterad to at most one-eighth of segment length. Tergites 5 and 6 with similar marking of black bands reaching medially to one-fourth to three-fourths of segment length, and laterally to at most half-length of segment. Tergite 7 often with black band reaching to at most one-third of segment length. Tergite 8 with median black triangle at anterior margin. Anterior halves and lateral parts of tergites sparsely, sometimes densely, covered with short coppery hairs. Sternils with silvery pilosity, paratergites densely covered with silvery hairs.


Female operculum (fig. 28). – Pale red-orange to
Figs. 29-31. Chremistica brooksi. – 29, male genitalia in ventral view; 30, male genitalia in lateral view; 31, male opercula in ventral view.
Chremistica brooksi Yaakop & Duffels of Peninsular Malaysia.

**Distribution** (fig. 71).

This species is probably endemic to the central part of Peninsular Malaysia.

**Description of male**

Ground colour of body orange-brown to dark ochreous; pronotum collar ochreous with greenish tinge. Lateral parts of ventral side of body from eyes to abdominal segment 8 densely covered with waxy white pilosity.

Head. – Dorsal side black, except anterior parts of vertex lobes and supra-antennal plates, and a pair of conical spots of the ground colour between lateral ocelli and eyes; the spots have narrow and inwardly curved lateral tips and enclose a black dot. Median dorsal spot of postclypeus at frontoclypeal suture semi-elliptic or triangular. Vertex sparsely covered with short coppery hairs. Postclypeus weakly prominent, anterior margin with broad black, transverse fascia, but transverse ridges in the fascia sometimes ochreous. Postclypeus with exception of postclypeal keel sparsely covered with coppery short hairs. Anterior half of gena and posterior margin of lorum black. Gena and lorum and anteclypeus sparsely covered with white hairs. Rostrum with dark brown apex just reaching hind coxae.

Thorax. – Black fasciae in paramedian oblique fisses triangularly widened, anteriorly connected with medially interrupted black fascia along anterior margin of pronotum, and posteriorly connected with an V-shaped, median black mark that stands upon the black fascia in the ambient fissure. Lateral oblique fisses with broad black fasciae in the paratype from Pahmungan, the other specimens have no marking in these fisses.

Mesonotum. – Paramedian obconical fields extending to half-length of mesonotum disc. Lateral obconical fields extending to seven-eighths of mesonotum and enclosing a narrowly elongate spot. Basal part of central mark densely covered with coppery pubescence.

Legs. – Orange-brown to ochreous. Spines on fore femora brown.

Tegmina and wings. – Basal cell olivaceous. Tegmina with brown venation in basal third, turning dark brown apically. Costal vein in basal half olivaceous, sometimes dark ochreous, turning dark brown apically. Wings with light brown to brown veination.

Operculum (fig. 31). – Orange-brown to ochreous. Basal two-thirds of medial margins slightly overlapping. Lateral margin convex, curled up and covered with waxy white pilosity.

Abdomen. – Tergite 1 with a pair of conspicuous, pubescent, waxy white dots laterodistally of posterior branches of cruciform elevation. Medial corners of tymbal covers brownish to dark brown. Black bands along anterior margin of tergites 2, 3 and 4 with median protrusion reaching to three-fourths of segment length, those on tergites 3 and 4 narrow laterad to at most one-eighth of segment length. Tergites 2-4 are much darker in the paratype from Pahmungan: tergite 2 black with exception of a narrow orange-brown line along posterior margin and a pair of transverse paramedian marks; black band on tergite 3 reaches medially to posterior tergite margin and narrows laterally to two-thirds of segment length; black band on
tergite 4 reaches medially almost to posterior tergite margin and narrows laterally to two-thirds of segment length. Black bands on tergites 5 and 6 reach to three-fourths of segment length and are equally wide along their whole length. In the paratype from Pahmungan tergites 5-6 are black with exception of a narrow orange-brown line along posterior tergite margins. Black bands on tergites 7 and 8 reach medially to half of segment length. In the paratype from Pahmungan tergite 7 with a black band reaching to three-fourths of segment length, and tergite 8 with a pair of paramedian orange-yellow marks. Dorsal side of abdomen covered with short coppery hairs. Posterior part of sternite 8 brownish. Anterior parts of sternites with sparse silvery pilosity, paratergites much denser pilose.

Genitalia (figs. 29-30). – Pygofer ochraceous, dorsally marked with brown. Lateral pygofer lobes in ventral view broad with semicircular, weakly inwardly curved, apical part; in lateral view with fairly deep, narrowly rounded incision between lateral margin of pygofer lobe and lateroventral pygofer margin. Basal pygofer lobe in lateroventral view fairly broad with narrowly convex, inwardly curved apical part reaching to half-length apical part of lateral pygofer lobe. Uncus brownish, broadly triangular, lateral margin weakly convex and thickened, and apical margin narrowly convex. Medial clasper lobe dark brown with lateral margin either convex with (three) small triangular teeth or straight without teeth, medial margin straight or slightly outcurved, and posterior margin convex with 4-6 small teeth. Lateral clasper lobe fairly large, oval-shaped, swollen, extending to two-thirds of medial clasper lobe. Basal plates convex.

Measurements (n= 3) – Body length 27.2-27.5 mm; head width 11.1-11.4 mm; pronotum width 10.5-10.6 mm; tegmen length 36.9-38.3 mm.

**Distribution** (fig. 71).

This species is restricted to Sumatra Island.

**Etymology**

This species is named in honour of Dr. C. J. Brooks, who collected two males of the type series.

*Chremistica nesiotes* Breddin, 1905 (figs. 32-35, 72, 84)

*Chremistica nesiotes* Breddin, 1905; 220, 221, Holotype ♂:

'Banguey / Ins. nördl. Borneo / W. Kedenburg / ded. 20.vii.1894'. 'Type' 'Cicada / nesiotes / Type! Bredd.'

(handwritten) (♀♀) (examined).


**Diagnosis**

*C. nesiotes* is a small species (body length males: 23.8-26.3 mm). It differs from another small species of the *bimaculata* group, *C. kecil* (body length: 23.9-25.3 mm) in the black bands on abdominal segments 4-6 that narrow laterad in *C. nesiotes* and are equally wide in *C. kecil*.

**Description**

Head, thorax and abdomen orange-brown to ochraceous, pronotum, mesonotum and underside of thorax sometimes with greenish tinge.

Head. – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of more or less triangular to conical spots of the ground colour between lateral ocelli and eyes; the spots have narrow inwardly curled lateral tips. Vertex sparsely covered with short silvery hairs. Postclypeus prominent. Transverse grooves, medial band and basal part of postclypeus with short silvery hairs. Lateral sides of postclypeus, gena and lorum covered with fairly long yellowish hairs. Rostrum with black-brown apex just reaching hind coxae.

Thorax. – Pronotum. Black fasciae in paramedian oblique fissure anteriorly connected with medially interrupted fascia along anterior margin of pronotum, and posteriorly connected with an U-shaped, median black mark that touches the black ambient fissure along anterior margin of pronotum collar. Black fasciae in paramedian oblique fissures sometimes enclose a narrow, oblique spot of the ground colour. Lateral parts of median anchor spot occasionally forming separate, narrow, transverse oval spots; proximal part of anchor spot bordered by the median V-shaped mark and separated from the rest of the spot by a broad transverse black line.

Mesonotum. – Paramedian obconical fields about half as long as mesonotum disc. Lateral obconical fields enclosing an, often (very) narrow, elongate spot. Central mark sometimes enclosing a pair of small oval spots of the ground colour; posterior part sparsely covered with coppery short hairs. Median point of central mark sometimes touching posterior margin of pronotum collar.

Legs. – Pale ochraceous, sometimes with yellowish green. Fore femora with two long, pale ochraceous to occasionally yellowish-brown, spines with dark-brown tips and a very small triangular spine distally of the most distal long spine.

Tegmina and wings. – Tegmina often with bronzy reflection. Basal cell light brownish. Costal vein ochraceous to light brownish sometimes greenish in basal half, turning dark brown apically. Venation of tegmina and wings light to dark brown in basal third, turning dark brown apically.

Male operculum (fig. 34). – Light brownish to

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Figs. 32-35. *Chremistica neotti*. – 32, male genitalia in ventral view; 33, male genitalia in lateral view; 34, male opercula in ventral view; 35, female operculum in ventral view.
yellowish, sometimes with greenish tinge. Basal two-fifths of medial margins slightly overlapping. Lateral margin straight to slightly convex, oblique and curled up; lateral margin black-brown at base. Surface of operculum with sparse golden pilosity.

Male abdomen. – Medial corners of tympanal covers brown to dark brownish. Tergites with black bands along anterior segment margins. Black bands on tergites 2, 3 and 4 often with triangular median protrusion reaching to half to three-fourths of segment length. Black bands on tergites 3 and 4 narrow laterad at to most one-eighth of segment length, those on tergites 5 and 6 reaching medially to half to three-fourths of segment, and slightly narrow laterad to at most half of segment length. Black bands on tergites 7 and 8 reach medially to one-fourth to half of segment length. Dorsal side of abdomen sparsely covered with golden pubescence, but anterior tergite margins densely, sometimes sparsely, covered with short coryperry hairs. Ventral side of abdomen pale ochraceous, sometimes dark olivaceous. Posterior half or one-fourth of sternite 8 sometimes somewhat darkened. Lateral parts of sternites sparsely and median part of sternites 3 and 4 densely covered with golden pubescence, but anterior tergite margins sparsely and median part of sternites 3 and 4 densely covered with golden pubescence.

Male genitalia (figs. 32-33). – Pygofer ochraceous, densely, sometimes sparsely, covered with short coryperry hairs. Ventral view with a broad and straight apical margin, a narrowly rounded, slightly inwardly curved, mediadistal corner, and an obtusely angled corner between apical margin of lobe and the more distal pygofer margin. Basal pygofer lobes with bluntly triangular, slightly inwardly curved, apical part reaching to three-fifths of pygofer length. Uncus light to dark brown, bluntly triangular, lateral and apical margins weakly convex. Medial clasper lobe broadly semicircular with rounded edges; lateral part of lobe strongly inwardly curved. Lateral clasper lobe small, narrowly rounded. Basal plates weakly convex.

Female operculum (fig. 35). – Pale ochraceous. Lateral margin straight to weakly convex, basal part brown-black. Lateral part of operculum sometimes with waxy white pilosity. Lateral distal corner of operculum obtuse. Posterior margin undulate and strongly curved toward meracanthus and with white to golden pilosity.

Female abdomen. – Black bands on tergites 2 and 3 reach medially to one-fourth to three-fourths of segment length and narrow laterad, but the triangular median protrusions of the black bands sometimes touch the posterior tergite margins. Black bands on tergites 4 to 6 reach medially to one-fourth to half of segment length but sometimes widen laterally. Anterior parts of sternites silvery pilose. Paratergites with dense silvery pilosity. Sternite 7 sometimes with a pair of paramedian brownish spots.

Measurements (n=10: 6.5). – Body length 23.8-26.3 mm; head width 9.5-11.2 mm; pronotum width 9.7-11.0 mm; tegmen length 33.2-35.8 mm; 29.6-29.9 mm.

ventral side of body from eyes to abdominal segment 8 densely covered with waxy white pilosity.

Head. – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of more or less conical to pentagonal spots of the ground colour between lateral ocelli and eyes; the spots have narrow curved tips and enclose a black dot. Vertex sparsely covered with short coppery hairs. Postclypeus prominent. Transverse grooves, medial band and basal part of postclypeus covered with yellow to coppery short hairs. Median dorsal spot at frontoclypeal suture often semi-elliptic, sometimes semi-oval. Anterior half or two-thirds of gena, and posterior half of lorum black. Gena, lorum and anteclypeus, with exception of keel, densely covered with long yellow to coppery hairs. Rostrum with black apex reaching just beyond middle coxae.

Thorax. – Pronotum. Broad black fasciae in paramedian oblique fissesures triangularly widened and sometimes enclosing a narrow spot, anteriorly connected with a pair of paramedian semispherical black spots at anterior pronotal ridge by a narrow black
fascia along the pronotal ridge, and posteriorly connected with V-shaped, median black mark touching the black ambient fissure along anterior margin of pronotum collar. Proximal part of median anchor spot, bordered by the median V-shaped mark, sometimes separated from the rest of the spot by a narrow to broad transverse black line. Lateral oblique fissures sometimes black or darkened.

Mesonotum. – Sometimes with greenish tinge. Paramedian obconical fields reaching to half-length of mesonotum. Lateral obconical fields extending to seven-eighths of mesonotum length and enclosing a large, sometimes fairly narrow, obconical area of the ground colour. Central mark sometimes enclosing a pair of small, oval spots of the ground colour; median point of central mark sometimes reaching to posterior margin of pronotum collar. Basal part of central mark sparsely covered with golden to coppery pubescence. Anterior branches of cruciform elevation often with a small apical black spot.

Legs. – Pale orange to ochaceous. Tips of spines on femora brown. Middle and hind tibiae often somewhat darkened at distal ends.


Male operculum (fig. 38). – Ochaceous, sparsely covered with silvery to golden pubescence. Basal two-fifths of medial margins slightly overlapping. Lateral margin slightly convex and curled up.

Male abdomen. – Medial corners of tymbal covers brown-black. Tergite 1 often with a pair of conspicuous, pubescent, waxy white dots laterodistally of posterior branches of cruciform elevation. Distal borders of black bands of tergites 2 to 4 usually straight, rarely with small triangular median protrusion, and reaching medially to two-thirds or three-fourths of segment length. Black bands on tergites 3 and 4 often narrowing laterad to at most two-fifths of segment length. Lateral part of band on tergite 3 sometimes enclosing a narrow, transverse spot of the ground colour. Black bands on tergites 5 and 6 medially reaching to half-to three-fourths of segment length, those on tergites 7 and 8 to one-fourth to half-of segment length. Dorsal side of abdomen densely covered with golden pubescence. Ventral side orange to ochaceous and silvery hirsute, mesodistal thirds of sternites 7 and 8 light brown to black-brown.

Male genitalia (figs. 36-37). – Pygofer ochaceous, dorsally marked with dark brown. Lateral pygofer lobe pale ochaceous with straight to very weakly convex apical margin and rounded rectangular medial corner; in lateral view with rectangular corner between apical margin of lobe and lateralventral pygofer margin. Basal pygofer lobes with slightly inwardly curved conical apical margin. Uncus ochaceous, lateral parts of uncus strongly swollen, oval-shaped and densely covered with brown to castaneous bristles. Medial clasper lobes semi-circular-shaped, with slightly convex medial margin, and strongly inwardly curved lateral margin. Lateral clasper lobe bulbous-shaped, reaching to lateral sides of pygofer; apical parts slightly curved inward. Aedeagus long. Basal plates strongly convex.


Female abdomen. – Tergite 1 often with a pair of conspicuous lateral white dots. Black band along anterior margin of tergite 2 reaches medially to three-fourths of segment length and narrow laterad, similar bands on tergites 3 and 4 reach medially to two-thirds of segment length and widen laterad, and those on tergites 5-7 reach to half-length or one-third (tergite 7) of the segment length. Distal borders of black bands on segments 2-7 sometimes with triangular median protrusion. Dorsal abdomen densely covered with shiny golden pubescence. Ventral side of abdomen brown. Sternites with shiny white pilosity and scattered long hairs, paratergites covered with dense white pilosity.

Measurements (n= 10♂ 4♀). – Body length ♂ 30.0-34.8 mm, ♀ 29.0-31.5 mm; head width ♂ 12.1-14.3 mm, ♀ 12.0-13.1 mm; pronotum width ♂ 12.4-14.1 mm, ♀ 11.9-13.2 mm; tegmen length ♂ 41.0-47.1 mm, ♀ 39.8-42.8 mm.

Distribution (fig. 73)

This species is recorded from the mountainous areas of the Malayan Peninsula. The two specimens labeled Sarawak, Limbang, Mendamit may be mislabeled; the occurrence of C. echinaria in Borneo needs confirmation.

Etymology

This species is characterized by the strongly swollen lateral parts of the uncus which are densely covered with brown to castaneous bristles. The name ‘echinaria’ refers to this feature that resembles the spiny surface of a sea-urchin (Echinus in Latin).

Chremística sumatrana Yaakop & Duffels sp. n. (figs. 40-43, 73, 86)

C. sumatrana can be distinguished from the other species in this group by the median part of the black band on tergite 2 reaching the posterior margin of tergite 2; this black band does not reach the posterior margin of the segment in the other species of the group.
Description

Ground colour of head, thorax, and abdomen dark yellow to dark ochraceous.

Head. – Dorsal side black except a pair of conical spots of the ground colour between ocelli and eyes; the spots often enclose a black dot; anterior angles of spots often with a curled tip separated from the spot by a very narrow black line. Vertex densely covered with short silvery hairs. Postclypeus weakly prominent. Dorsal side of head covered with yellow to coppery hairs. Median dorsal spot at frontoclypeal suture of postclypeus broadly, sometimes narrowly, semieliptic. Lateral margins and basal part of postclypeus covered with silvery hairs. Anterior two-thirds of gena and posterior fourth of lorum black. Gena, lorum, and anteclypeus, with exception of keel, sparsely covered with long white to coppery hairs. Rostrum with black apex reaching beyond middle coxae.

Thorax. – Pronotum. Black fasciae in paramedian oblique fissures triangularly widened and sometimes enclosing a narrow, oblique spot of the ground colour, anteriorly connected with medially interrupted black fascia along anterior margin of pronotum, and posteriorly connected with an V-shaped, median black mark that is fused with the black ambient fissure along the pronotum collar. Proximal part of median anchor spot bordered by median V-shaped mark and separated from rest of spot by a broad transverse black line. Lateral oblique fissures sometimes darkened.

Mesonotum. – Paramedian obconical fields extending to half-length of mesonotum disc. Lateral obconical fields extending to seven-eighths of mesonotum and enclosing (very) narrow, elongate spots of the ground colour. Basal part of central mark sparsely covered with coppery and sometimes with white to coppery hairs. Median point of central mark sometimes reaching posterior margin of pronotum collar.

Legs. – Pale ochraceous, sometimes orange-brown, and sparsely covered with short coppery hairs. Fore femora with slightly darkened fasciae connecting the pale brown spines.


Male operculum (fig. 42). – Dark ochraceous, sometimes orange-brown and covered with silver pilosity. Basal two-fifths of medial margins slightly overlapping. Lateral margins straight to weakly convex, basal one-third black.

Male abdomen. – Tergite 1 with a pair of conspicuous pubescent, waxy white dots laterodistally of posterior branches of cruciform elevation. Medial corners of tymbal covers dark brown. Median part of distal border of black band on tergite 2 reaching posterior tergite margin. Distal border of black bands along anterior margin of tergites 3 and 4 rarely with small triangular median protrusion, reaching to four-fifths of segment length. Posterior margin of black band on tergite 3 with large sublateral excavation. Band on tergite 4 narrows lateral to at most half of segment length. Bands on tergites 5 and 6 reaching to four-fifths of segment length and about equally wide along whole length. Dorsal side of abdomen densely, sometimes sparsely, covered with golden to coppery pubescence. Ventral side of abdomen dark brown, sometimes pale ochraceous, and densely covered with silver pilosity. Posterior half to two-thirds of sternites 7 and 8 brown.

Male genitalia (figs. 40-41). – Pygofer light to dark ochraceous, dorsally marked with dark brown. Lateral pygofer lobe with weakly convex and slightly inwardly curved apical margin and rounded rectangular medial corner; in lateral view with right-angled corner between lateral margin of pygofer lobe and lateroventral pygofer margin. Basal pygofer lobes with convex apical margin, reaching to three-fifths of pygofer length, apical parts of lobes curved inward. Uncus ochraceous, apical part brownish, bluntly triangular and elevated in lateroventral view. Medial clasper in lateroventral view with straight to slightly convex lateral margin, an oblique medial margin, and a straight to weakly convex apical margin. Lateral clasper lobes fairly large and reaching to lateral sides of pygofer. Basal plate weakly convex.

Female operculum (fig. 43). – Pale ochraceous and covered with silvery hairs. Lateral margin brownish to black, weakly to fairly strongly convex. Laterodistal corner obtuse and broadly rounded. Posterior margin undulate.

Female abdomen. – Tergite 1 without a pair of conspicuous lateral white dots. Black bands along anterior margins of tergite 2-3 medially (almost) reaching posterior segment margin and laterally narrowed, similar bands on segment 4-6 reach medially to two-thirds of segment length and slightly widen lateral, while the band on tergite 7 reaches to one-third of segment length. Distal borders of black bands sometimes with triangular median protrusion. Ventral side of abdomen ochraceous and with scattered white pilosity.

Measurements (n=10♂ 3♀). – Body length ♂ 26.9-31.7 mm, ♀ 23.0-26.2 mm; head width ♂ 11.4-12.3 mm, ♀ 9.7-10.9 mm; pronotum width ♂ 11.3-12.8 mm, ♀ 9.9-10.8 mm; tegmen length ♂ 38.6-41.0 mm, ♀ 33.0-37.9 mm.
Distribution (fig. 73)
This species is restricted to Sumatra Island. The specimen from New Guinea is probably mislabeled; the genus *Chremistica* does not occur in this island.

**Chremistica kecil** Salmah & Zaidi, 2002  
(figs. 44–47, 73, 87)


Figs. 44–47. *Chremistica kecil*. – 44, male genitalia in ventral view; 45, male genitalia in lateral view; 46, male opercula in ventral view; 47, female operculum in ventral view.
Diagnosis

C. kecil can easily be distinguished from the other species of the binauculata group by its small size (body length male: 23.9-25.3 mm), C. kecil is slightly larger than C. minor (body length 20.1-21.7 mm, but C. kecil is missing the transverse black lines on the underside of the postclypeus that are found in C. minor.

Description

Ground-colour of head, pronotum and mesonotum orange-brown to ochraceous, pronotum collar often with greenish tinge.

Head. – Dorsal side black except anterior parts of vertex lobes and supra-antennal plates and a pair of conical spots of the ground colour with narrow lateral, inwardly curved, tips, between lateral ocelli and eyes; spots enclosing a black dot. Vertex sparsely covered with short silvery hairs. Dorsal side of postclypeus with three pairs of black transverse grooves connected to the mediadorsal black part; transverse ridges between black grooves sometimes black. Underside of postclypeus including grooves ochraceous. Median glabrous area of postclypeus dorsally black.

Mesonotum. – Paramedian obconical fields extending to half-length of mesonotum disc. Later obconical fields enclose a (very) narrow elongate spot and reach to seven-eighths of mesonotum disc. Central mark sparsely covered with coppery short hairs at base. Median point of central mark sometimes reaching to posterior margin of pronotum collar.

Legs. – Pale ochraceous, sometimes with yellowish green. Fore femora with somewhat darkened fascia connecting pale brown spines. Middle and hind tibiae sometimes with pale brown annulation at distal ends.


Male abdomen. – Medial corners of tymbal covers brown to dark brownish. Tergites 2-8 with black bands along anterior margins. Black bands on tergites 2 to 5 with triangular median protrusion, reaching to two-thirds of segment length, those on tergites 3 and 4 narrow lateral to at most one-fourth of segment length. The black band on tergite 6 reaches to half the segment length and widens laterally, tergites 7 and 8 have very narrow black bands. Dorsal side of abdomen sparsely covered with golden pubescence. Anterior tergite margins sparsely, sometimes densely, covered with short coppery hairs. Ventral side of abdomen pale castaneous, but posterior half of sternite 2, anterior fourth of sternites 3 to 7, and posterior fourth of sternite 8 somewhat darkened. Lateral parts of sternites sparsely and median part of sternites 3 and 4 densely covered with golden pubescence.

Male genitalia (figs. 44-45). – Pygofer ochraceous, but apical parts of lateral pygofer lobes, anal valves and the whole uncus darkened. Lateral pygofer lobe weakly developed, with broad and convex apical margin and an obtusely angled corner between apical margin of lobe and the more distal pygofer margin. Basal pygofer lobes with bluntly triangular apical margin and slightly outwardly curved apical part. Uncus short, bluntly triangular and elevated. Medial clasper lobe triangular with weakly convex medial margin. Lateral clasper lobe triangular with slightly convex lateral margin and inwardly curved apically. Aedeagus long and stout, with a long ventral process attached to basal part of aedeagus.


Female abdomen. – Dorsal side of abdomen pale castaneous, sometimes with greenish tinge. Distal border of black bands along anterior margin of tergites 2 to 6 with triangular median protrusion, reaching to three-fourths of segment length. Tips of median triangular protrusion of tergites 2 and 3 sometimes touching posterior margins of tergites 2 and 3. Ventral side of abdomen pale ochraceous, sometimes yellowish green. Anterior tergite margins and lateral parts of sternites sparsely covered with golden pubescence.
Measurements (n=2♂, 2♀). – Body length 23.9-25.3 mm, ♀ 21.2-23.9 mm; head width 9.6-10.0 mm, ♀ 8.7-10.0 mm; pronotum width 9.3-10.4 mm, ♀ 8.6-9.7 mm; tegmen length 31.4-31.6 mm, ♀ 29.3-31.3 mm.


Distribution (fig. 73)
This species is only known from Tasik Chini, Pahang in Peninsular Malaysia.

Chremistica tridentigera group
This group was erected by Bregman (1985) for 11 species of Chremistica. Five species that are currently attributed to the tridentigera group occur in Sundaland: C. tridentigera, C. biloba, C. umbrosa, C. borneensis and C. minor. Possible synapomorphies for the tridentigera group are (1) the arc-shaped claspers that are laterally connected with the uncus and (2) the long lateral pygofer lobes, which are at least 3 times as long as wide and sometimes twisted.

C. tridentigera, a new species from Borneo with arc-shaped claspers but relatively short lateral pygofer lobes is tentatively added to the tridentigera group.

C. tridentigera, C. biloba, C. umbrosa and C. borneensis and two other members of the tridentigera group, viz., C. siamensis Bregman from Thailand and C. mixta (Kirby) from Sri Lanka (Bregman, 1985), have a dorsal aedeagal process. This is a possible synapomorphy for these species. The lateral oblique fissures on the pronotum are black in C. tridentigera, C. biloba, C. umbrosa and C. borneensis; this line is missing in C. minor. The anterior margin of the median black marking on the vertex is trilobate in C. tridentigera, C. biloba, C. umbrosa and C. borneensis; the black marking on the vertex is more broadly connected with the anterior margin of the head in C. minor. In the pontisanaka and bimaculata groups the vertex is black with exception of the anterior parts of vertex lobes and supra-antennal plates and a pair of spots between lateral ocelli and eyes. C. tridentigera, C. umbrosa and C. borneensis have more or less triangular male opercula, while the medial margins of the opercula are not overlapping.

C. tridentigera, C. biloba and C. borneensis are restricted to Sabah. C. minor is recorded from Borneo, Sarawak and the southern part of Peninsular Malaysia. C. umbrosa is known from Peninsular Malaysia and Sumatra.

Chremistica tridentigera (Breddin, 1905)
(Figs. 3, 48-51, 74, 88)

Cicada tridentigera; Weidner & Wagner 1968: 142.

Diagnosis
C. tridentigera and the next species, C. biloba, are very similar in their external features, but can be distinguished by characters of the male genitalia. The females belonging to C. tridentigera or C. biloba have been listed below as ‘females of C. tridentigera or C. biloba’. The description of the female of C. tridentigera given below has been made after female specimens from Danum Valley since males of C. tridentigera have been recorded from this locality.

Description
Ground-colour of head, pronotum, and mesonotum orange-brown to ochraceous, pronotum collar often with greenish tinge. Ventral side of body brown to dark brown and with lateral bands of waxy white pilosity running from eyes to abdominal segment 8.

Head. – Vertex with median black marking enclosing ocelli, anterior margin of this marking trilobate with its median triangular lobe reaching frontoclypeal suture, and posterior margin broadly connected with posterior margin of head. The median marking continues laterad in an irregular fascia that widens to the eye and encloses a mushroom-shaped spot of the ground colour at posterior margin of head; the black colouration next to the eyes sometimes continues along anterior margins of supra-antennal plates and vertex lobes. Vertex sparsely covered with short coryperty to white hairs. Postclypeus prominent and with median, semi-circular, or sometimes triangular, area of the ground colour at frontoclypeal suture; this area is separated from a median, elliptic, glabrous area of the ground-colour by a transverse fascia formed by the fusion of the black colour of the upper 2-3 transverse grooves. The glabrous area reaches to the 7th or 8th pair of black transverse grooves and is narrowly connected with a semi-oval area of the ground colour at the clypeal suture. Anterior half of gena, posterior half of lorum, and anteclypeus with exception of keel, black. Gena, lorum and anteclypeus, with exception of keel, covered with long white to coryperty hairs. Transverse grooves, medial band and basal part of postclypeus covered with white pilosity. Rostrum with black apex just passing middle coxae.

Thorax. – Pronotum. A pair of central black, more...
or less rounded triangular spots at anterior ridge of pronotum. Black fasciae in paramedian oblique fissures fairly broad and connected with V-shaped median black mark at anterior margin of pronotum collar. Comma-shaped black fasciae extending from middle of paramedian oblique fasciae to the posterior. Lateral oblique fissures with broad black fasciae which are connected at both ends with a black fascia in the ambient fissure.

Mesonotum. – Paramedian obconical fields reaching to half-length of mesonotum. Lateral obconical fields extending to three-fourths of mesonotum length and enclosing an elongate spot of the ground colour. Central mark encloses a pair of fairly large spots of the ground colour. Anterior branches of cruciform elevation sometimes with a narrow black transverse line.

Legs. – Dark ochraceous, sometimes with castaneous tinge. Fore femora with black fascia connecting the dark brown spines. Fore tibiae with dark brown fascia on outer side.

Tegmina and wings. – Tegmina often with bronzey reflection. Basal cell olivaceous. Transverse veins at bases of second and third apical areas with very light brownish suffusion. Venation of tegmina ochraceous in basal third, turning dark brown apically.

Figs. 48–51. Chemisticta tridentigena. – 48, male genitalia in ventral view; 49, male genitalia in lateral view; 50, male opercula in ventral view; 51, female operculum in ventral view.
Costal vein ochraceous to brownish in basal half, apical half black. Venation of wings light to dark brown.

Male operculum (fig. 50). – Brown to dark ochraceous. Broadly triangular, medial margins not overlapping and slightly diverging from base. Lateral margins slightly oblique, straight, and curled up.

Male abdomen. – Tymbal covers brown, sometimes dark brown. Tergite 2 brownish with a median black-brown mark. Tergites 3-6 black-brown, but tergite 3 with a pair of conspicuous lateral, white pubescent, waxy patches. Tergite 7 with black-brown anterior band, medially extending to half the segment length and laterally widening to whole length of segment; posterior part of tergite orange-brown. Tergite 8 with narrow brownish anterior part and orange-brown posterior part. Dorsal side of abdomen sparsely to densely covered with golden pubescence. Ventral side brown, sometimes red-brown, and with sparse coppery pubescence.

Male genitalia (figs. 48-49). – Pygofer pale ochraceous, but lateral pygofer lobes, uncus, clasper lobes and aedeagus light brownish. Lateral pygofer lobes with blunty triangular, medially curved, apical part. Pygofer in lateral view with rounded incision between lateral pygofer lobe and lateroventral margin of pygofer. Basal pygofer lobes with blunty triangular apical margin reaching to two-thirds of lateral pygofer lobes, and situated next to these lobes. Uncus narrow, 3-4 times as long as wide, and slightly narrowing to a very weakly bilobate apical margin. Median juxtaposed ends of arc-shaped clasper lobes thickened and with short castaneous bristles pointing proximad. Median part of lateral clasper lobe at half-length with weakly to strongly developed pointed appendage directed proximad. Aedeagus with subapical dorsal weakly to strongly developed pointed appendage divided ends of arc-shaped clasper lobes thickened and with short castaneous bristles pointing proximad. Median part of lateral clasper lobe at half-length with weakly to strongly developed pointed appendage directed proximad. Aedeagus with subapical dorsal process. Basal plate convex.

Female operculum (fig. 51). – Brown to dark ochraceous. Lateral margin undulate. Laterodistal corner obtuse. Posterior margin convex and curved toward meracanthus.

Female abdomen. – Tergite 2 black, turning brownish lateral. Tergites 3-6 black, tergite 3 with conspicuous shiny white pubescent, oval lateral patches that expand on tergite 4. Tergite 7 with very narrow, black anterior band, that laterally widens to almost whole length of segment, posterior part of segment light ochraceous. Tergite 8 with narrow black-brown anterior band and orange-brown posterior part. Ventral side of abdomen brown to red-brown, sternite 7 sometimes variegated with black-brown. Segment 9 ochraceous, dorsally with W-shaped black-brown figure and ventrally sometimes with vague black-brown marking.

Measurements (n=5♂, 5♀). – Body length ♂ 29.4-30.4 mm; ♀ 26.7-32.0 mm; head width ♂ 11.6-12.2 mm, ♀ 11.3-13.9 mm; pronotum width ♂ 11.3-11.9 mm, ♀ 10.7-14.2 mm; tegmen length ♂ 38.8-43.0 mm, ♀ 37.1-43.2 mm.


Females of C. tridentigera or C. biloba. BORNEO: MALAYSIA: SARAWAK: Beaufort, Kg. Selangon, 3.xi.1991, Khamis Selamat, 1♂ (UMK); Danum Valley, 5°01’S 117°47’E, 29.ix.1987, 200m, A. H. Kirk-Spriggs, NMW Sabah (Borneo), Expedition, NMW, z. 1987, 094, light trap sample, understory forest, 1♀ (NMWC), same data but 1.x.1987, 220m, 1♀ (NMWC); Lembah Danum, 2.iv.1989, Salleh, Ismail and Nor, 1♀ (UMK); Borneo, Sabah, Danum Valley, 5°01’S 117°47’E, 1.x.1987, 220m, A. H. Kirk-Spriggs, NMW Sabah (Borneo), Expedition, NMW, z. 1987, 094, light trap sample, understory forest, 1♀ (NMWC); 60 km W Lahad Datu, DVFC, nr Segama Bridge: 150 m, 20.xi.1987, 117°48’E 4°58’N, J. Huisman and R. de Jong, 1♂ (ZMA); Tawau, Tibow, 5-9.iv.2000, 390m, Noramly Muslim and Ruslan, 1♀ (UKM); Tawau Hills Pk, 1-3.iv.2000, elev. 390m, Noramly Muslim, 1♀ (UKM).

Distribution (fig. 74)
This species has been described from Bangey (≠ Banggi) island north of Borneo and is also recorded from Borneo (Brunei; Malaysia: Sarawak and Sabah) (see also Bregman 1985).

Chremistica biloba Bregman, 1985
(figs. 52-55, 70, 89)


Differential diagnosis
This species can only be separated from C. tridentigera by characters of the male genitalia. The uncus of C. biloba is broad, slightly longer than wide and tapers into two blunt lobes with strongly convex apical margins; the uncus of C. tridentigera is narrow,
3-4 times as long as wide, and slightly narrows to a very weakly bilobate apical margin. The median part of the lateral clasper lobe of *C. biloba* is missing the weakly to strongly developed pointed appendage directed proximad as found in *C. tridentigera*. The median juxtaposed ends of the clasper lobes of *C. biloba* are thickened as in *C. tridentigera* but more densely covered with fairly long dark ochraceous bristles.

Measurements (n= 1♂). – Body length 29.9 mm; head width 12.4 mm; pronotum width 12.6 mm; tegmen length 41.5 mm.


Distribution (fig. 70)
Bregman (1985) described this species from Borneo (Sarawak and Kalimantan). No new material of this species has become available.
Chremistica umbrosa (Distant, 1904)  
(figs. 56-59, 74, 90)

*Cicada umbrosa* Distant 1904: 330, 331. Holotype \( \delta \): 'Bouro Doherty', red label 'Type' (BMNH) [not examined].

*Rihana umbrosa*; Distant 1906b: 34; Distant 1912: 28; Moulton 1912: 128; Moulton 1923: 129.


*Rihana pisanga* Moulton, 1923: 69, 129, 131, 168, Pl. IV.

Fig. 20. a. Lectotype \( \delta \); 'Pulau Pisang' (BMNH) [not examined]; Kato 1932: 155; Salmah & Zaidi 2002: 229 (in syn. of *C. umbrosa*).

*Chremistica pisanga*; Metcalf 1963: 178; Bregman 1985: 52 (in syn. of *C. umbrosa*); Zaidi et al. 1996: 60; Salmah & Zaidi 2002: 229 (in syn. of *C. umbrosa*).

**Diagnosis**

This species can be distinguished from the other species of the genus by the marking on the mesonotum: the lateral obconical field encloses a broadly

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Figs. 56-59. *Chremistica umbrosa*. – 56, male genitalia in ventral view; 57, male genitalia in lateral view; 58, male opercula in ventral view; 59, female operculum in ventral view.
Description

Ground-colour of head, thorax and dorsal side of abdomen dark yellow to brown, sometimes with greenish tinge. Lateral parts of ventral side of body from eyes to abdominal segment 8 densely covered with waxy white pilosity.

Head. – Black median marking on vertex consisting of a median triangle enclosing the median ocellus and attached to the frontoclypeal suture, and two black markings each enclosing a lateral ocellus and narrowing towards the supra-antennal plates and the vertex lobes; markings enclosing the median and lateral ocelli more or less fused. Black marking along inner sides of eyes. Somewhat darkened dot between lateral ocelli and eye. Vertex sparsely covered with short white to coppery hairs. Postclypeus prominent. Postclypeus with broad median area of the ground colour at frontoclypeal suture that narrows into a meandering of a median triangle enclosing the median ocellus and eye. Vertex lobes; markings enclosing the median and lateral ocelli more or less fused. Black marking along inner sides of eyes. Somewhat darkened dot between lateral ocelli and eye. Vertex sparsely covered with short white to coppery hairs. Postclypeus prominent. Postclypeus with broad median area of the ground colour at frontoclypeal suture that narrows into a median, elliptic, black-brown bordered glabrous area reaching to 6th to 7th pair of black transverse grooves; C. umbrosa also differs from its congeners in the strangely diverging medial margins of the male opercula.

Description

Ground-colour of head, thorax and dorsal side of abdomen dark yellow to brown, sometimes with greenish tinge. Lateral parts of ventral side of body from eyes to abdominal segment 8 densely covered with waxy white pilosity.

Head. – Black median marking on vertex consisting of a median triangle enclosing the median ocellus and attached to the frontoclypeal suture, and two black markings each enclosing a lateral ocellus and narrowing towards the supra-antennal plates and the vertex lobes; markings enclosing the median and lateral ocelli more or less fused. Black marking along inner sides of eyes. Somewhat darkened dot between lateral ocelli and eye. Vertex sparsely covered with short white to coppery hairs. Postclypeus prominent. Postclypeus with broad median area of the ground colour at frontoclypeal suture that narrows into a median, elliptic, black-brown bordered glabrous area reaching to 6th to 7th pair of black transverse grooves; C. umbrosa also differs from its congeners in the strangely diverging medial margins of the male opercula.

Postclypeus prominent. Postclypeus with broad median area of the ground colour at frontoclypeal suture that narrows into a median, elliptic, black-brown bordered glabrous area reaching to 6th to 7th pair of black transverse grooves; basal part of postclypeus black. Gena, lorum and anteclypeus, with exception of anterior margin and keel of anteclypeus, black, and sparsely covered with long white to coppery hairs. Rostrum with black-brown apex just reaching hind coxae.

Thorax. – Pronotum. Broad black fasciae in paramedian oblique fissures connected with a pair of paramedian black triangles at anterior pronotal ridge by a narrow black fasciae along the pronotal ridge. Median black mark at anterior margin of pronotum collar consisting of two juxtaposed black dots that are not connected with the paramedian oblique fissures. Lateral oblique fissures occasionally partly or entirely black. Ambient fissure partly or entirely with a narrow black line.

Mesonotum. – Paramedian obconical fields reaching to half-length of mesonotum, medial margins often concave and irregular. Lateral obconical fields extending to seven-eighths of mesonotum and enclosing a broadly elongate, irregular spot of the ground colour; but medial and lateral margins of obconical field often open. Central fascia of central mark usually not connected with pair of spots in front of cruciform elevation.

Legs. – Fore femora pale yellow with dark brown fascia connecting dark brown spines. Middle and hind femora dark ochraceous with castaneous tinge. Tibiae dark ochraceous, distal ends of middle and hind tibiae somewhat darkened.


Male abdomen. – Tergite 1 black. Medial corners of tymbal cover brownish black. Distal border of black band on tergite 2 straight or with small triangular median protrusion, and reaching medially to half to two-thirds of segment length. Tergite 3 with pair of lateral, white, pubescent oval patches. Distal border of black band on tergite 3 usually straight, but occasionally with paramedian concavities and small median triangular protrusion, and reaching medially to half to two-thirds of segment length. Black bands on tergites 4-6 about equally wide along whole length and reaching to three-fourths or two-thirds of segment length. Distal borders of black bands on tergites 7 and 8 reach medially to one-fourth to three-fourths of segment length and laterally almost to hind margin of segment. Dorsal side of abdomen densely covered with yellow to waxy white, sometimes golden, pubescence. Ventral side of abdomen dark brown to brownish black.

Male genitalia (figs. 59-60). – Pygofer pale yellow to ochraceous, dorsally marked with black. Lateral pygofer lobes fairly long and strongly tapering to acute, medially curved, apical part; pygofer in lateral view with broadly rounded incision between lateral margin of pygofer lobe and lateroventral pygofer margin. Basal pygofer lobes extending to half-length of lateral pygofer lobe and partly hidden behind these lobes. Uncus broad, elevated, and consisting of a pair of rounded rectangular fused lobes. Lateral part of uncus slightly curved downward; lateral edge of uncus bearing bundle of reddish bristles pointing proximad. Lateral clasper lobes brownish black, hook-shaped. Juxtaposed ends of medial clasper lobes slightly swollen and provided with bundle of reddish bristles. Aedeagus with broad brown dorsal process fairly close to opening of aedeagus. Basal plate weakly convex.

Female operculum (fig. 59). – Pale ochraceous. Lateral margin straight or weakly undulate. Laterodistal corner of operculum rounded rectangular. Posterior margin strongly concave in lateral half but
strongly convex toward meracanthus.

Female abdomen. – Dorsal borders of black bands along anterior margins of tergites 2 to 8 often with triangular median protrusion, reaching medially to half or sometimes one-fourth of segment length and laterally almost to posterior segment margin. Segment 9 dorsally with a median M-shaped black marking and ventrally with a pair of black to brown dots, and with broad brown to black fasciae along lower segment margins. Ventral side of abdomen with dark brown to brownish black marking on median part of sternites. Dorsal sides of abdomen densely covered with short corypheid covering to silvery hairs, ventral side with silver pilosity.

Measurements. (n= 6♂ 6♀). – Body length ♂ 33.4-35.1 mm, ♀ 20.4-20.0 mm; head width ♂ 13.4-14.1 mm, ♀ 11.4-12.0 mm; pronotum width ♂ 11.0-11.5 mm, ♀ 10.3-10.8 mm; tegmen length ♂ 43.2-44.6 mm, ♀ 39.4-40.2 mm.


Distribution (fig. 74)

This species is recorded from the southern part of the Malayan Peninsula, the eastern coastal area of Sumatra, and from Banka Island and various other islands in the southern Strait of Malacca.

Chremistica borneensis Yaakop & Duffels sp. n. (figs. 60-63, 75, 91)

Type material. – 4♂ 1♀ Holotype ♂: MALAYSIA, Sabah / TAWAU HILL, jungle lodge, 300 m’ garden /secondary / growth at light / 27-29.iii.2001 / J. P. and M. J. Duffels’ (ZMA). – Paratypes: same data as holotype, 1♂ (ZMA) 1♂ (UKM) 1♂ (UMS); Tawau Hills, M.p. 1-3.iv.2000, elev. 390m, Noramly Muslim, 1♀ (UKM).

Diagnosis

C. borneensis differs from the other species of the tridentigera group in the relatively short lateral pygofer lobes that reach just beyond the basal pygofer lobes. The marking of the body in C. borneensis is similar to that of C. tridentigera and C. biloba, but C. borneensis is missing a pair of conspicuous lateral white waxy patches on tergite 3 as found in C. tridentigera and C. biloba. C. borneensis is also distinctly larger than the other two species: body length male C. borneensis 33.9-35.7 mm, C. tridentigera: 26.7-32.0 mm, C. biloba: 29.9 mm.

Description

Ground-colour of head and thorax and dorsal side of abdomen orange-brown to brownish ochraceous, pronotum collar with greenish tinge. Ventral side of body brown to dark brown and with lateral bands of waxy white pilosity running from eyes to abdominal segment 8.

Head. – Vertex with median black marking enclosing ocelli, anterior margin of this marking trilobate, median lobe broadly connected from frontoclypeal suture; posterior margin bilobate and touching posterior margin of head. The median marking continues laterad in an irregular fascia that widens to the eyes and encloses a triangular spot of the ground colour, with a central black dot, at the posterior margin of the head. Vertex sparsely covered with short corypheid covering to white hairs. Postclypeus strongly prominent, and with median, semi-elliptic area of the ground colour at frontoclypeal suture, which is connected with a median, elliptic, glabrous area reaching to the 7th or 8th pair of black transverse grooves, and more ventrally with an oval area of the ground colour at the clypeal suture. Genal, posterior two-thirds of lorum, and anteclypeus with exception of keel, black. Gena, lorum and anteclypeus with exception of keel, densely covered with long white to yellow hairs. Rostrum...
with brownish apical part just reaching hind coxae.

Thorax. – Pronotum. A pair of central black, more or less rounded triangular spots at anterior pronotal ridge. Black fasciae in paramedian oblique fissures broad and connected with the U-shaped median black mark at anterior margin of pronotum collar. Short, curved, black fasciae extending from middle of paramedian oblique fasciae to the posterior. Lateral oblique fissures with broad black fasciae that are connected at both ends with a narrow black line in the lateral part of the ambient fissure.

Mesonotum. – Paramedian obconical fields reaching to half-length of mesonotum. Lateral obconical fields extending to three-fourths of mesonotum.

Figs. 60-63. Chremistica borneensis. – 60, male genitalia in ventral view; 61, male genitalia in lateral view; 62, male operculum in ventral view; 63, female operculum in ventral view.
length and enclosing a very narrowly elongate, lanceolate spot of the ground colour. Central mark enclosing a pair of legs of the ground colour.

Legs. – Brown with castaneous tinge to dark brown. Fore femora with dark brown fasciae connecting black spines. Basal parts of tibiae light brown.


Male operculum (fig. 62). – Dark brown to black. Broadly triangular, medial margins not overlapping, and slightly diverging from base. Lateral margins straight to slightly oblique and curled up.

Male abdomen. – Dorsal side castaneous to brownish black. Medial corners of tymbal covers brownish black. Black band on tergite 2 reaching medially to two-thirds of segment length and narrowing laterad. Black band on tergite 3 reaching to two-thirds or three-fourths of segment length. Black bands on segments 4-6 and 8 about equally along whole length and reaching to about half the segment length, that on segment 7 extends to one-third of segment length. Anterior two-thirds of tergites 3-6 sparsely with golden pubescence. Posterolateral margins of tergites 3 to 6 with densely set silvery hairs. Ventral side of abdomen dark brown to brownish black. Stermites sparsely covered with golden pubescence.

Male genitalia (figs. 60-61). – Pygofer yellow to ochraceous, dorsally marked with black. Uncus, claspers, and aedeagus ochraceous to dark brown. Lateral pygofer lobe fairly short with rounded apical part, which is slightly curved mediad. Pygofer in lateral view with rounded incision between lateral pygofer lobe and lateroventral margin of pygofer. Basal pygofer lobes with rounded apical margin, slightly shorter than lateral pygofer lobes and reaching to half the pygofer length. Uncus broad at base, slightly narrowing proximad and tapered into two bluntly triangular lobes which have slightly convex apical margins. Median juxtaposed ends of claspers rounded rectangular. Lateral clasper lobes obtuse. Aedeagus with long dorsal process. Basal plate strongly convex.

Female operculum (fig. 63). – Brownish black. Lateral margin undulate. Laterodistal corner obtuse. Posterior margin convex and curved toward meracanthus.

Female abdomen. – Dorsal side castaneous to brownish black. Black bands on tergites 2 to 3 reach medially to half the segment length and widen laterally; those on tergites 4 to 8 reach medially to one-fourth of segment length and widen laterally. Black band on tergite 9 reaching mediadly to three-fourths of segment length. Posterior margins of tergites 4 to 7 covered with white to golden pubescence. Tergites 8 and 9 covered with golden pubescence. Ventral side of abdomen brownish and with golden pubescence. Median part of sternite 7 black.

Measurements. (n= 4♂ 1♀) – Body length ♂ 33.9-35.7 mm, ♀ 31.7 mm; head width ♂ 14.1-14.2 mm, ♀ 13.8 mm; pronotum width ♂ 13.6-14.5 mm, ♀ 14.2 mm; tegmen length ♂ 42.2-45.9 mm, ♀ 43.2 mm.

Distribution (fig. 75)

This species is only recorded from Tawau Hills, Sabah, Borneo.

Chremistica minor Bregman, 1985
(figs. 64-67, 75, 92)


Diagnosis

C. minor has arc-shaped claspers and long basal pygofer lobes and is therefore allocated in the tridentigera group, in spite of the fact that it has a different marking on the head, more alike to that of the pontianaka group. C. minor is the smallest species in the tridentigera group (body length: 20.1-21.7 mm), and can also be recognized by the very narrow black lines in the paramedian oblique fissures on the pronotum and the short paramedian obconical spots that reach to one-third of length of mesonotum only.

Description

Ground-colour of head and thorax dark yellow, occasionally reddish-brown, with greenish tinge. Lateral parts of ventral side of body from eyes to segment 8 densely covered with waxy white pilosity.

Head. – Black marking on median part of head enclosing ocelli and reaching to frontoclypeal suture, posterior margin sometimes touching posterior margin of head. Median marking narrows laterodistally to three-fourths of head length. Black marking along inner sides of eyes. Vertex sparsely covered with short white to coppery hairs. Postclypeus prominent. Transverse grooves on postclypeus black. Median, broadly semi-elliptic spot of the ground colour at frontoclypeal suture connected with a median glabrous area ventrally narrowing to 7th pair of black transverse grooves; the median glabrous area is narrowly connected with an oval area at the clypeal suture. Anterior two-thirds of gena, lorum and anteclypeus, with exception of keel, black. Gena, lorum and anteclypeus, with exception of keel, densely covered with long silvery hairs. Rostrum with dark
brown apex reaching middle coxae.


Mesonotum. – Paramedian obconical fields short, reaching to one-third of mesonotum disc. Lateral obconical fields extending to five-sixth of mesonotum length and enclosing broad, oval spots of the ground colour. Central mark enclosing a pair of fairly large
spots of the ground colour, basal part of central mark sparsely covered with coppery white hairs. Anterior branches of cruciform elevation sometimes with small black apical spot.

Legs. – Dark yellow, sometimes with ochraceous tinge. Fore femora with dark brown fascia connecting the yellow-brown spines. Distal ends of middle and hind tibiae somewhat darkened.


Male operculum (fig. 62). – Basal two-fifths of medial margins broadly overlapping. Lateral margin oblique, slightly convex, and curled up, basal part black.

Male abdomen. – Dorsal side dark ochraceous. Tymbal covers ochraceous. Distal border of black bands of tergites 2 to 8 usually straight and occasionally with small triangular median protrusion, reaching medially to one-fourth to half of segment length. Dorsal side of abdomen sparsely covered with ochraceous to brown pubescence. Ventral side of abdomen laterally. Dorsal side of abdomen sparsely covered with ochraceous, basally and apically narrowly black. Median part of sternites 2 and 8 dark brown to brownish black.


Female operculum (fig. 67). – Sparsely covered with golden pubescence. Lateral margin weakly convex. Lateral distal corner of operculum obtuse. Posterior margin straight and oblique toward meracanthus.

Female abdomen. – Dorsal side ochraceous. Black band on tergite 2 reaching to four-fifths of segment length. Distal borders of black bands of tergites 3 to 8 usually straight, with small triangular median protrusion reaching to half of segment length, and widening laterally. Dorsal side of abdomen sparsely covered with golden pubescence. Ventral side of abdomen brown, and sparsely covered with golden pubescence. Lateral part of sternite 6 black. Sternite 7 black. Posterior halve of sternites 8 and 9 black.

Measurements (n=2♂ 1♀). – Body length ♂ 20.1-21.7 mm, ♀ 20.8 mm; head length ♂ 9.5-10.1 mm, ♀ 9.9 mm; pronotum width ♂ 8.3-9.5 mm, ♀ 9.1 mm; tegmen length ♂ 29.5-31.9 mm, ♀ 27.7 mm.


Distribution (fig. 75)

This species has been recorded from Gunung Mulu, Sarawak by Bregman (1985). The present study reveals its occurrence in the southern part of Peninsular Malaysia.

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Fig. 68. Distribution of *Chremistica pontianaka*.

Fig. 69. Distribution of *Chremistica guamusangensis* (rounds) and *C. niasica* (squares)
Fig. 70. Distribution of Chremistica biloba (diamonds), C. cetacauda (reversed triangles) and C. hollowayi (rounds).

Fig. 71. Distribution of Chremistica bimaculata (rounds), C. brooki (squares) and C. malayensis (reversed triangles).
Fig. 72. Distribution of Chremistica nesiotes.

Fig. 73. Distribution of Chremistica echinaria (rounds), kecil (triangles) and C. sumatrana (diamonds).
Fig. 74. Distribution of *Chremistica tridentigera* (squares) and *C. umbroa* (rounds).

Fig. 75. Distribution of *Chremistica borneensis* (squares) and *C. minor* (rounds).
Figs. 84-87. Chremistica species. – 84, C. nesiotes, Lembah Danum, Sabah, Borneo; 85, C. echinaria, holotype, Larut Hills, Perak, Malaysia; 86, C. sumatrana, holotype, Pladjoe, Sumatra; 87, C. kecil, paratype, Tasik Chini, Pahang, Malaysia.
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