

*Si quid novisti rectius istis, candidus imperti;  
ti non, his utere mecum.*

*Horatius*

## INTRODUCTION

During the many years in which I have worked in the Museum Zoologicum Bogoriense, I have made constant use of an elaborate card index of the Odonata of the Old World exclusive of the Ethiopian Region. I began work upon this index twenty-six years ago and ever since it was completed and made up to date, some fifteen years later, the names of all systematic categories down to subspecies and varieties have been constantly checked against all fresh information contained in the literature in order to cover all published descriptions, drawings and locality records that came under my notice. Though the existing literature on Malaysian Odonata had thus already been put on record and made available to myself, its use by persons unfamiliar with the Order remained naturally attended with great difficulties. The increase in our knowledge of these insects has been very considerable during the last half century, and the publications dealing with this fauna have become so numerous and appeared in so many different journals that any attempt at writing a comprehensive work on the Odonata of Malaysia should be preceded by a reliable list of the species inhabiting the area. It therefore seemed to me highly desirable that a catalogue should be prepared giving references to descriptions of both sexes of all species known to inhabit the Malaysian sub-region and stating accurately their distribution as far as we know it at present.

### LIMITS OF THE AREA SURVEYED

It is generally understood that the exact boundaries of a zoogeographical zone must always be of an arbitrary nature and it is obvious that such a zone is basically physiographical rather than zoological. As has been pointed out by CHASEN<sup>1)</sup> a basic, or physiographical "Malaysia", introduced already in 1918 by BODEN KLOSS<sup>2)</sup> as a sub-region of the Orient-

<sup>1)</sup> F. N. CHASEN (1935). A Handlist of Malaysian Birds. A systematic list of the birds of the Malay Peninsula, Sumatra, Borneo and Java, including the adjacent small islands. Bull. Raffles Mus. 11, xx + 389 pp., 1 map. Same author (1940) : A Handlist of Malaysian Mammals, etc. *Ibid.* 15, xx + 209 pp., 1 map.

<sup>2)</sup> C. BODEN KLOSS (1918). Notes on Malayan and other Mouse-deer. J. Fed. Mal. States Mus. 7 : 245 (footnote). See also: C. BODEN KLOSS (1929). The zoogeographical boundaries between Asia and Australia and some Oriental Sub-regions. Bull. Raffles Mus. 2 : 1-10, 4 maps.

tal Region, can easily be defined as all land masses standing on the Sunda Shelf below about Lat.  $10^{\circ}$  N, an area in which the sea-depths are less than one-hundred and usually less than forty fathoms. But as a zoogeographical zone the unmodified Sundaland is not satisfactory as it would of course include Palawan and adjacent islands in the north and exclude some of the deep water islands off the westcoast of Sumatra, i.e., the Simalur and Mentawai groups and Engano. Therefore, it has been thought expedient by students of ornithology as well as other zoologists, to let the area undergo some modifications on zoological and geographical grounds, and the result has been a Malaysian area, whose northern boundary is at the narrowest part of the Isthmus of Kra across Peninsular Siam in the west, and between the islands Balabac and Banguay off northern Borneo in the east; here the border line separates Celebes from Borneo and runs towards the deep strip of water known as Lombok Strait, which can be regarded as the southern end of the boundary between the Malaysian and Austro-Oriental subregions and which is so well-known as Wallace's Line. To the faunist this region is such a natural unit that there is but little doubt as to the convenience of its borders (see map).

The Malaysia of the present paper is thus the same as that defined by CHASEN in his "Handlists" and the practical reasons for excluding the Nicobar Islands, Tenasserim and Palawan are essentially similar to those mentioned in the introductory chapters of one of CHASEN's books (*loc. cit.* 1935, p. v-vi).

In the systematic part of this list the Malaysian localities for the various species are arranged in four rows corresponding to four Provinces, Malayan, Sumatran, Javan and Bornean. This arrangement, which I have, with some minor adjustments, adopted from CHASEN's handlist, I have found to be satisfactory because it is not only fairly well in agreement with zoological and geographical facts but also offers a convenient and simple arrangement. It should be borne in mind, however, that these four provinces are by no means equal in value, and that the affinities, of the dragonfly fauna inhabiting some of the island groups in the South China Sea, with either the Sumatran or Bornean province have not yet been satisfactorily established.

Continental distribution is indicated only in two ways. Siam implies the northern part of the Malay Peninsula down to about Lat.  $6^{\circ}$  N, i.e. southern Peninsular Siam. Malaya means roughly the southern half of the Peninsula, i.e. all the Malay States, but the islands are mentioned separately. For a topographical account of these four provinces the reader is referred to the introduction in CHASEN's handlists.



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No effort has been made to investigate the correctness of the geographical names of islands, provinces or areas within the Malaysian subregion accepted by me in this list, because the denomination and orthography of these names has now become completely unrestrained. I have considered it best to remain conservative in this respect and to use common sense names; some of these will doubtless be criticized by one or another student of the area, but this seems inevitable<sup>1)</sup>.

### CLASSIFICATION AND ARRANGEMENT

In the present list the sequence of families and subfamilies proposed by TILLYARD and FRASER<sup>2)</sup> has mainly been followed. These authors acknowledged themselves that the task of tracing out the evolutionary lines within the Order, even with our present knowledge, is becoming a very formidable one and consequently it has so far been impossible to offer a phylogenetically accurate classification of both suborders without considerably more knowledge of fossil forms and the early stages of recent species. Within the *Zygoptera* I have abstained from a further division into subfamilies except in the *Coenagriidae*, in which the *Arginae* seem to stand rather apart from the rest of the family. As to the anisopterous family *Libellulidae*, the system proposed by RIS in the Selysian monograph appears to me still the most natural one; this was also accepted by TILLYARD in his reclassification except that the supposedly parallel groups of the Old and New World were merged into subfamilies, a course which, I think, is more in accordance with our present day views on relationship. With the exceptions of the *Rhyothemistinae* as a separate subfamily as well as the recently proposed name *Macrodiplactidae* for a distinct family to contain the *Urothemis* group, I have followed the system of TILLYARD and FRASER.

In regard to the sequence of genera, I have adhered to the usual custom of modern writers in following the phylogenetic system (based mainly on venational characters), which starts with the more primitive members of each family and leads on to the more advanced and highly specialised ones. In the matter of genera I have, in some instances, perhaps been somewhat conservative by taking a rather broad interpretation of a genus. The aim to investigate carefully the finer morphological structure

1) Absurdities like Acheen (for Atjeh), Krakatoa (for Krakatau) and Rhio (for Riau or Riouw) should certainly be avoided.

2) R. J. TILLYARD. A reclassification of the Order *Odonata*. Based on some new interpretations of the venation of the dragonfly wing. With notes, preface and completion thereof by F. C. FRASER. *Australian Zoologist*, 9, 1938-1940. (Pt. I : p. 125-169, 27 figs., Nov. 1938; pt. II : p. 195-221, 11 figs., Dec. 1939; pt. III : p. 359-396, 15 figs., Dec. 1940.)

of as many members of a genus as can be obtained, in an attempt to establish their relationships, is praiseworthy and has usually revealed quite interesting facts: the segregation of species-groups has often paved the way for a better understanding of their origin, migration routes, and possible evolution. My objection to the introduction into the generic nomenclature of these clusters of species is that it brings into existence names for almost if not quite all the groups that can possibly be segregated within a given genus. It is my considered opinion that a certain amount of consistency in judging questions of degree of difference is necessary in order to maintain the greatest possible equivalence among genera. With regard to some modern treatments of Odonate genera, however excellent and important they may be in other respects, it must be said that the extreme views expressed upon generic subdivision have unfortunately sometimes lead to the introduction of new names whose admission or rejection should be decided on a basis of utility and practical necessity rather than on personal views. To my mind generic names for species-groups within such genera like *Rhinocypha*, *Vestalis*, *Lestes*, *Ictinogomphus*, etc. are premature, or at the best should be used to denote categories of subgeneric rank, because they pretend to be more than they really are and upset the balance of the system. In this handlist I have dodged the difficulty of deciding upon the acceptance or synonymizing of several of these recently instituted names by giving them in bold italic print under the heading of the genus in which their type species were formerly included. By so doing every name whose generic value is here called in question will remain easily accessible to those who require a further splitting up of the genus.

For convenience' sake species and subspecies are arranged alphabetically. Where the typical race of a given species does not occur within the limits of the present fauna it has none the less been included, along with a citation of the original description and habitat, the whole reference being placed within square brackets.

#### SYNONYMY AND RANGE DESCRIPTION

Except in very few instances the synonymy given is purely regional and, of course, strictly chronological. Every effort has been made to cover the literature as completely as possible. As regards the family *Libellulidae*, the basic literature prior to 1916 has been thoroughly quoted and summarized by F. RIS in the nine fascicules of his classical 'Libellulinen' monograph of the Baron E. DE SELYS LONGCHAMPS' collections. Apart from the monograph itself, only those synonyms and references to the literature



have, therefore, been quoted which have been proposed and published since the completion of RIS's work on this family, unless of course when they were incorrectly placed or when there is a possibility that they may represent valid subspecies, in which case the older ones are also quoted.

It was also considered advisable to cite references to the original descriptions of the genera and to mention the name, habitat and sex of the genotypes as well. Fortunately, the generic synonymy is so limited and well known that it was only occasionally necessary to include it. It is hoped that the great mass of references thus included will put the searcher on the track of a more complete synonymy beyond the boundaries of Malaysia.

In preparing the handlist no species has been recorded definitely from any island except upon authority believed to be unimpeachable. Nearly all entries have been recorded from the original; and in a large number of cases the specimens themselves on which they were based (and which are scattered in various European museums) were carefully re-examined, compared with the description, and relegated to their proper place in the system. This often proved of some importance, especially from the point of view of the zoogeographer, where new localities meant an interesting addition to the known range of the insect in question. Many references have been pursued only to find that the author has quoted or followed a previous author without comments or critical remarks being given. These references have been omitted from the synonymy, and the same course has been followed in those instances where it was evident that faunal lists of trivial names were merely compiled from the existing literature. It is likely that some locality records or other references quoted under a given species will turn out to be cited under the wrong specific name, which may have occurred in those instances where a species has not yet been critically examined or where a composite species was split up into a number of others by some subsequent reviser. Where doubt exists as to the occurrence of a given species on an island, or about the correctness of the identification, the fact is always indicated by putting a question mark or a brief statement somewhere in the text. It is for the Museum specialist to decide in the future, provided that the specimens in question should still be traceable.

Yet, the list is based primarily on an examination of specimens — more than eighty thousand individuals from various islands having passed through my hands — and to a much less degree on literature. The extensive reference collections in the Bogor Museum have proved invaluable for this purpose; in fact, they were more important zoogeographically than the

published records in the literature, since in the course of years a wealth of new data has been accumulated on the geographical distribution, as well as on the relationship and ecology of Malaysian forms. Therefore, in the present list I have thought it worth while to make use also of this information, not only in a purely systematic sense but also in so far as dragonfly life is concerned. Thus, several of the nomenclatural combinations adopted are novel, while a very large proportion of the insular locality records are here also published for the first time. I have followed the excellent example set by E. MAYR<sup>1)</sup> in his "List of New Guinea Birds", by giving, as far as our present knowledge permits, a brief indication of the habitat of at least one subspecies of each species. I am well aware of the shortcomings of this attempt but these biological notes may at least vivify the dullness of the rest of this work and convey a rough picture of the ecology of the Malaysian Odonata.

Work upon the present handlist was begun about a year ago, and December 31, 1953 is to be considered as the closing date of the manuscript.

#### GENERAL REMARKS

As to our knowledge of the distribution of dragonflies in Malaysia, there are few — if any — other branches of entomology where students are further ahead. It is a pleasurable task to mention how much knowledge has been gained by the full co-operation of field-workers with the systematist. The splendid collections made by L. COOMANS DE RUITER, Mrs M. E. WALSH and A. M. R. WEGNER in Sumatra and Borneo; the excellent results achieved by F. J. KUIPER in Billiton and by F. C. DRESCHER in Java; — they are all good instances of the advance made as a result of detailed and skilful field-work. I will not here dilate upon this point but at the same time call attention to the magnitude of work still to be done.

Our knowledge of the fauna of Siam and the Malay States is decidedly scanty as compared with that of parts of Sumatra or Java, and it is beyond question that many a retiring species still awaits discovery in the extensive jungles of the Peninsula. Leaving the more recent activities of the late H. M. PENDLEBURY out of account, no expert collecting has been done in Malaya since the close of the last and the beginning of this century, when N. ANNANDALE and F. F. LAIDLAW as members of SKEAT'S Expedition explored parts of the Siamese Malay States and A. GRUBAUER made his collections on the Pahang-Perak frontier.

<sup>1)</sup> E. MAYR. List of New Guinea birds. A systematic and faunal list of the birds of New Guinea and adjacent islands. Published by the American Museum of Natural History, New York, N.Y. 1941, xi + 260 pp., one map.



Very little is also known of the northern portion of Sumatra, the lowlands of Djambi and Benkulen, and the mountain ranges and hills of the middle south.

TABLE I. NUMERICAL ANALYSIS OF THE MALAYSIAN ODONATE FAUNA (SPECIES AND SUBSPECIES).

Family	Malaysia	Malay Peninsula	Sumatra	Java	Borneo	Billiton	Bangka	precinctive to other satellite islands or countries	Name of satellite islands or country
ZYGOPTERA	244	77	87	57	128	32	13	11	
<i>Amphipterygidae</i>	3	1	1	—	1	—	—	1	Pulau Tioman
<i>Chlorocyphidae</i>	38	10	15	6	19	3	2	2	Engano; Bali
<i>Epallagidae</i>	14	3	6	2	8	1	1	—	
<i>Agridae</i>	11	5	5	2	4	1	1	—	
<i>Lestidae</i>	7	3	2	5	5	3	—	—	
<i>Megapodagruidae</i>	13	3	5	1	8	1	—	—	
<i>Platystictidae</i>	30	7	4	5	13	—	—	1	Mentawai
<i>Protoneuridae</i>	23	7	8	4	18	6	3	—	
<i>Platzenemididae</i>	29	10	7	5	15	1	—	2	Siam; Engano
<i>Cocnagruidae</i>	76	28	34	27	37	16	6	5	Simalur; Nias; Mentawai; Engano; Banguey
ANISOPTERA	228	112	135	99	131	57	40	7	
<i>Gomphidae</i>	56	16	27	16	20	7	2	—	
<i>Aeshnidae</i>	35	13	24	17	26	8	4	—	
<i>Cordulegasteridae</i>	4	1	1	1	2	—	—	1	Nias
<i>Corduliidae</i>	28	12	15	14	13	4	3	—	
<i>Libellulidae</i>	105	70	68	51	70	38	31	6	P. Wé; Simalur; Mentawai; Engano
Total	472	189	222	156	259	89	53	18	

With the exception of Nias, the islands of the West Sumatra Chain are tolerably well explored with regard to dragonflies, but turning to the islands on the opposite side of the Sumatran mainland, the Riouw and Lingga archipelagoes for instance, the available information is so scanty as to be almost negligible. The same is true of the Anambas and Natuna

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TABLE II. PROPORTION OF REGIONAL ENDEMISM WITHIN THE MALAYSIAN SUBREGION (SPECIES AND SUBSPECIES).

Family	Confined to Malaysia	Confined to Provinces of:			
		Malaya	Sumatra	Java	Borneo
ZYGOPTERA	198	15 = 7.6%	34 = 17.1%	17 = 8.6%	85 = 43%
<i>Amphipterygidae</i>	3	1	—	—	1
<i>Chlorocyphidae</i>	32	—	8	4	12
<i>Epallagidae</i>	11	—	3	—	4
<i>Agrüidae</i>	7	—	1	1	3
<i>Lestidae</i>	5	—	—	1	1
<i>Megapodagrüidae</i>	12	—	2	1	7
<i>Platystictidae</i>	30	7	5	5	13
<i>Protoneuridae</i>	21	1	—	1	11
<i>Platycnemididae</i>	24	3	3	2	12
<i>Coenagrüidae</i>	53	3	12	2	21
ANISOPTERA	148	19 = 13%	22 = 15%	12 = 8.8%	29 = 20%
<i>Gomphidae</i>	52	10	9	7	9
<i>Aeshnidae</i>	26	1	2	2	5
<i>Cordulegasteridae</i>	4	—	1	—	1
<i>Corduliidae</i>	22	4	2	1	6
<i>Libellulidae</i>	44	4	8	2	8
Total	346	34 = 9.8%	56 = 16%	29 = 8.4%	114 = 33%

island groups; especially the latter stand much in need of careful investigation. Fresh collections are equally needed from Bangka which, considering its size and topography, is the least known island of the whole archipelago, in marked contrast with Billiton about which we are very well informed.

The extremely rich and varied fauna of Borneo, with its interesting faunal boundaries, is now fairly well known as far as the lowlands and some of the Sarawak mountains are concerned; but no serious collecting has ever been done in the hills and the higher mountains of the east, and most of the interior of this enormous island is also *terra incognita*.

Fortunately enough, most parts of Java had been explored rather thoroughly in search of dragonflies before the radical destruction of its hill-side vegetation and the remaining forests on the volcanoes was started. Yet, there are still some little known areas in the extreme west (Udjongkulon Peninsula) and southeast of the island where the ardent collector may still make a few unexpected discoveries.



TABLE III. ENDEMISM WITHIN THE MALAYSIAN SUBREGION, ARRANGED ACCORDING TO PROVINCES (INCLUSIVE OF THE SMALLER SATELLITE ISLANDS).

Province	<i>Zygoptera</i>		<i>Anisoptera</i>		<i>Odonata</i>		
	Total	Endemic	Total	Endemic	Total	Endemic	Approx. percentage of whole fauna
Malaya	78	15	112	19	190	34	= 17.8%
Sumatra <sup>1)</sup>	94	31	140	22	234	53	= 22.6%
Java	58	17	101	12	159	29	= 18.2%
Borneo	129	85	131	29	260	114	= 43.8%
Billiton	22	3	57	—	89	3	= 3.4%
Bangka	13	—	40	—	53	—	—
Malaysia	244	198	228	148	472	346	= 73%

<sup>1)</sup> In this table the islands Bangka and Billiton have been kept apart from the Sumatran Province.

#### ZOOGEOGRAPHICAL SUMMARY

Though this handlist purports to be based upon the results of a study from the present day aspect regarding zoogeography, it is beyond the scope of this work to give a detailed analysis of this fauna. Yet, I cannot dismiss the subject without some comment and therefore I have summarized the results in three Tables, from which the most noteworthy facts can easily be deduced (Table I, II and III).

It is tempting to compare the Odonate fauna of Malaysia with that of New Guinea and surrounding islands, because this is the only other substantial land mass within the Indo-Australian Archipelago whose dragonfly fauna is also fairly well known at present. The New Guinea area was formerly considered a part of the Australian Region and accordingly called the Papuan Subregion. However, as far as its dragonflies is concerned, I believe to have shown that it is as distinctive a zoogeographical area as the Oriental or the Australian Regions. <sup>1)</sup> As will appear from our analysis given in Table IV, the outstanding feature of the Papuan fauna is that although it is undoubtedly of Asiatic origin, having the general oriental 'facies' and lacking palaeogenic and entogenic Australian families, it is so specialised that it has become a distinct zoocentre. The enormous difference between the Odonate fauna of Malaysia and New Guinea is at once evident from the accompanying table (Table IV).

<sup>1)</sup> See: M. A. LIEFTINCK (1949). The Dragonflies (Odonata) of New Guinea and neighbouring islands. Part VII. Nova Guinea, new ser., 5 : 238-244.

TABLE IV. COMPARISON OF THE ODONATE FAUNA OF MALAYSIA AND NEW GUINEA.

	Malaysian not Papuan		Papuan not Malaysian		Common to Malaysian and Papuan Subregions	
	Genera	Species or subspecies	Genera	Species or subspecies	Genera	Species
<b>ZYGOPTERA</b>						
<i>Amphipterygidae</i>	1	3	1	1	—	—
<i>Chlorocyphidae</i>	4	38	—	6	1	—
<i>Epallagidae</i>	2	14	—	—	—	—
<i>Agriidæ</i>	2	11	—	3	1	—
<i>Lestidae</i>	2	7	—	9	1	—
<i>Megapodagriidæ</i>	3	13	2	21	—	—
<i>Platystictidae</i>	1	30	—	12	1	—
<i>Protoneuridae</i>	2	23	2	39	1	—
<i>Platycnemididae</i>	5	29	8	16	—	—
<i>Coenagriidæ</i>	6	71	8	98	9	5 (+ 1)
<b>ANISOPTERA</b>						
<i>Gomphidae</i>	12	56	—	1	1	—
<i>Aeshnidae</i>	7	32	3	18	3	3
<i>Cordulegasteridae</i>	1	4	—	—	—	—
<i>Corduliidæ</i> <sup>1)</sup>	3	28	1	25	4	—
<i>Libellulidæ</i> <sup>2)</sup>	17	90	9	93	25	15 (+ 8)
Total	68	449	34	342	47	23 (+ 9) <sup>3)</sup>

1) The genera *Metaphya* LAIDLAW and *Anacordulia* TILLYARD are congeneric.

2) *Risiophlebia dohrni* (KRÜGER), from Malaysia, and *R. risi* (CAMPION), from southern New Guinea, are not congeneric.

3) Besides 15 species with a wide Indo-Pacific range, 9 polytypic species are represented in both subregions by different geographical races.

A complete list of all species on record from the Malaysian subregion, arranged systematically, with an indication of their distribution, as far as we know it at present, is given on page 173 at the end of this paper.

#### ACKNOWLEDGEMENTS

There is one person, who first introduced me to the study of Malaysian dragonflies, and whose help and encouragement have been so great that without them this work could never have been carried to an end: my learned friend F. F. LAIDLAW, of "Moniaive", Ventnor. I would like



to add that the idea of the distributional list at the end of this work is entirely his, and that I have only made up to date the draft prepared by Dr. LAIDLAW in England many years since; I am therefore deeply sensible of his permission to make use of it.

There now remains the hope that my efforts to smooth the path of my successors in dealing with the systematics and biology of Malaysian dragonflies will be appreciated and that the present handlist may, to some extent, lighten the burdens of odonatists in the future, in so far that they need no longer search for a source of information on the literature, before submitting themselves to studying these attractive and beautiful insects, — either in their 'sanctum' or in the field.

MUSEUM ZOOLOGIUM BOGORIENSE  
BOGOR (JAVA), INDONESIA

February, 1954

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# HANDBOOK OF MALAYSIAN ODONATA

## Suborder ZYGOPTERA

### Family AMPHIPTERYGIDAE

#### Genus DEVADATTA KIRBY

*Devadatta* KIRBY, 1890, Syn. Cat. Odon.: 111.  
(Genotype: *Tetraneura argyroides* SELYS, ♂ Malaya)

#### *Devadatta argyroides argyroides* (SELYS)

*Tetraneura argyroides* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 449-450. — ♂ Singapore (Malaya).

*Devadatta argyroides* LAIDLAW, 1903, Fasc. Malayenses, Zool. 1 : 199-200 (♂ ♀ Malaya).

*Devadatta argyroides* NEEDHAM, 1903, Proc. U.S. Nat. Mus. 26, pl. 53, fig. 8 (wing); WILLIAMSON, 1904, ibid. 28 : 170, fig. 4 (♂ wings, Siam); FRASER, 1938, Proc. R. Ent. Soc. London, 7 : 138, fig. 1 (wings).

*Devadatta argyroides* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 300-301 (Malaya).

*Devadatta argyroides* RIS, 1927, Zool. Meded. 10 : 3-4 (♂ ♀ central Sumatra), fig. 1 (♂ app.); LAIDLAW, 1934, Stylops, 3 : 102 (key); LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 552 (Malay States); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 4 (S. Sumatra).

Range. — Siam; Malaya.

Sumatra.

Habitat. — Wells, spring-fed brooks and marshes at the foot of waterfalls in dense primitive forest, 250-650 m. In the Malay States up to about 1600 m. Larva (as yet undescribed) of stocky build, strongly chitinised, with highly modified, opaque, triquetro-tuberculate caudal gills.

#### *Devadatta argyroides tiomanensis* LAIDLAW

*Devadatta argyroides tiomanensis* LAIDLAW, 1934, Stylops, 3 : 102. — sex? Tioman I. (of eastern Johore, Malaya).

Range. — Tioman I. (Malaya).



**Devadatta podolestoides podolestoides LAIDLAW**

- Devadatta podolestoides podolestoides* LAIDLAW, 1934, *Stylops*, 3 : 101-103, fig. 1 (♂ app.) — ♂♀ W. Borneo (terr. typ.); Mt. Kinabalu (N. Borneo).  
*Devadatta argyroides* KENNEDY, 1920, *Ohio J. Sci.* 21, pl. 3, fig. 82-83 (penis, Sarawak).  
*Devadatta argyroides* LAIDLAW, 1912, *J. Str. Br. R. Asiatic Soc.* 63 : 93 (N. Sarawak); LAIDLAW, 1915, *Proc. Zool. Soc. London* : 33 (♂♀ N. Borneo).  
*Devadatta spec.* LAIDLAW, 1934, *J. Fed. Mal. States Mus.* 17 : 550 (Mt. Kinabalu).  
*Devadatta podolestoides* KIMMINS, 1936, *J. Fed. Mal. States Mus.* 18 : 79 (♂♀ Sarawak).

Range. — Borneo.

Habitat. — Reported from the foothills of Mt. Kinabalu up to 1000 m, and taken on Mt. Dulit in Sarawak at about 1300 m.

**Family CHLOROCYPHIDAE****Genus LIBELLAGO SELYS**

*Libellago* SELYS, 1840, *Mon. Lib.*: 200.

(Genotype: *Calopteryx lineata* BURMEISTER, ♂ Java)

*Micromerus* RAMBUR, 1842, *Hist. nat. Ins. Névropt.*: 238.

(Genotype: *Calopteryx lineata* BURMEISTER, ♂ Java)

*Melanocypha* FRASER, 1949, *Bull. Inst. Roy. Sci. nat. Belg.* 25 : 7, 12.

(Genotype: *Micromerus snellemani* SELYS, ♂ Sumatra)

**Libellago aurantiaca (SELYS)**

*Micromerus aurantiacus* SELYS, 1859, *Bull. Acad. Belg.* (2) 7 : 448-449. — ♂ "Malacca" (terr. typ.); ♂ Singapore.

*Micromerus aurantiacus* ALBARDA, 1881, in VETH, *Midden Sum. Exped., Neur.*: 10 (♂ Malaya), pl. 3, fig. 3 & 3 a (♂ struct., coloured); WILLIAMSON, 1904, *Proc. U.S. Nat. Mus.* 28 : 172, fig. 7 (♂ abd., Trang, Lower Siam); LAIDLAW, 1923, *J. Mal. Br. R. Asiatic Soc.* 1 : 329.

*Micromerus annandali* LAIDLAW, 1903, *Fasc. Malayenses, Zool.* 1 : 197-198 (♂ Jalor).

*Libellago aurantiaca* LIEFTINCK, 1932, *Konowia*, 11 : 2; COOMANS DE RUITER, 1936, *De Trop. Natuur*, 25 : 77-78 (♂ W. Borneo), fig. 5 (♂ insect); LIEFTINCK, 1937, *Treubia*, 16 : 57-58 (♂ Sumatra; Billiton; Borneo); COWLEY, 1937, *Trans. R. Ent. Soc. London*, 86 : 3, fig. 6 (penis, Terasserim); LAIDLAW, 1950, *ibid.* 101 : 269; LIEFTINCK, 1950, *Treubia*, 20 : 632 footnote (morphol.).

Range. — Siam; Malaya.

Sumatra (extreme south); Billiton.

Borneo.

Habitat. — Streams and rivers in low country.

**Libellago dorsocyana LIEFTINCK**

*Libellago dorsocyana* LIEFTINCK, 1937, Treubia, 16 : 56-57, fig. 1 (♂ body). — ♂ S. Borneo.

*Libellago dorsocyana* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 269; LIEFTINCK, 1950, Treubia, 20 : 632 footnote (morphol.).

Range. — Borneo (south).

Habitat. — Described from the lowlands near Kotawaringin. A riverine species, very common over the large sluggish rivers of southern Borneo. Oviposits in driftwood and tree-trunks fallen into the water.

**Libellago hyalina (SELYS)**

*Micromerus hyalinus* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 447. — ♂ ♀ "Malacca" (*terr. typ.*); Singapore.

*Micromerus hyalinus* LAIDLAW, 1923, J. Mal. Br. R. Asiatic Soc. 1 : 329 (key), 330; RIS, 1927, Zool. Meded. 10 : 10 (♂ ♀ C. Sumatra); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 325 (♂ key).

*Libellago hyalina* LIEFTINCK, 1932, Konowia, 11 : 2; COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 77 (♂ W. Borneo); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 3, fig. 2 (penis, Borneo); LAIDLAW, 1950, *ibid.* 101 : 268; LIEFTINCK, 1950, Treubia, 20 : 632 footnote (morphol.).

Range. — Malaya.

Sumatra; Bangka; Billiton.

Borneo.

Habitat. — Sluggish lowland streams, rivers, irrigation-channels etc., usually in shady surroundings.

**Libellago lineata lineata (BURMEISTER)**

*Calopteryx lineata* BURMEISTER, 1839, Handb. Ent. 2 : 826. — ♂ Java.

*Micromerus lineatus* RAMBUR, 1842, Hist. nat. Ins. Névropt.: 238 (♂ Java); SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.): 65 (*pars*, Java); SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 236-237 (*pars*, Java), pl. 6, fig. 3-4 (♂ wings); CALVERT, 1898, Trans. Amer. Ent. Soc. 25 : 47 (♂ type); KRÜGER, 1898, Stett. ent. Ztg. 59 : 85-86 (♂ Penang); LAIDLAW, 1903, Fasc. Malayenses, Zool. 1 : 197 (♂ ♀ Malaya); WILLIAMSON, 1904, Proc. U.S. Nat. Mus. 28 : 171, fig. 5 (♂ ♀ wings, Siam); RIS, 1912, Tijdschr. Ent. 55 : 158 (Java); LAIDLAW, 1923, J. Mal. Br. R. Asiatic Soc. 1 : 329 (key).

*Micromerus signatus* KRÜGER, 1898, Stett. ent. Ztg. 59 : 86-88 (♂ ♀ Penang; ♂ Java); LAIDLAW, 1923, J. Mal. Br. R. Asiatic Soc. 1 : 329 (key); FRASER, 1926, Treubia, 8 : 460.

*Libellago lineata lineata* LIEFTINCK, 1932, Konowia, 11 : 2, 9; LIEFTINCK, 1934, Treubia, 14 : 387 (Java, bionomics); FRASER, 1934, Fauna Brit. India, Odon. 2 : 63 (Siam); COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 78 (Java), pl.



fig. 6 (♂ ins., coloured); LIEFTINCK, 1936, *ibid.* 25, jub. no.: 108 (W. Java), fig. 12 (photo ♂ ins.); COWLEY, 1937, *Trans. R. Ent. Soc. London*, 86 : 4 (penis, note); LIEFTINCK, 1950, *Treubia*, 20 : 632-633 (flötes), fig. 1 (♂ wings, Java); LAIDLAW, 1950, *Trans. R. Ent. Soc. London*, 101 : 269.

*Micromerus lineatus lineatus* SCHMIDT, 1934, *Arch. Hydrob. Suppl.* 13 : 325 (key), 326 (Sum., Java), fig. 11 (♀ thor.).

Range. — Siam; Penang; Malaya.

Sumatra.

Java.

Borneo (south).

Habitat. — Lowland streams and rivers, preferably in open country.

In southern Borneo only found sparingly over the river Mentaja (Sampit), in company of *dorsocyana*.

#### *Libellago phaeton* (LAIDLAW)

*Micromerus phaeton* LAIDLAW, 1931, *J. Fed. Mal. States Mus.* 16 : 245-246. — ♂ ♀ Bettotan (N. Borneo).

*Libellago phaeton* LIEFTINCK, 1932, *Konowia*, 11 : 2; COWLEY, 1937, *Trans. R. Ent. Soc. London*, 86 : 4 (penis, note); LAIDLAW, 1950, *ibid.* 101 : 268; LIEFTINCK, 1950, *Treubia*, 20 : 632 footnote (morphol.).

Range. — Borneo (north).

Habitat. — Only known from the type locality, in low country.

#### *Libellago semiopaca* (SELYS)

*Micromerus semiopacus* SELYS, 1873, *Bull. Acad. Belg.* (2) 36 : 617. — ♂ Sarawak (N. W. Borneo).

*Micromerus martinae* KARSCH, 1891, *Entom. Nachr.* 17 : 243-244 (♂ N.E. Sumatra).

*Micromerus affinis* LAIDLAW, 1902, *Proc. Zool. Soc. London*, 1 : 90-91 (♂ ♀ Malaya), pl. 6, fig. 7 (♂ insect).

*Micromerus semiopacus* FÖRSTER, in LAIDLAW, 1903, *Fasc. Malayenses*, *Zool.* 1 : 198-199 (notes, Malaya); RIS, 1911, *Ann. Soc. ent. Belg.* 55 : 233-234 (♂ W. Borneo); LAIDLAW, 1923, *J. Mal. Br. R. Asiatic Soc.* 1 : 329 (key); LAIDLAW, 1931, *J. Fed. Mal. States Mus.* 16 : 183 (Malaya), 245 (Borneo, note aberr.!).

*Libellago semiopaca* LIEFTINCK, 1932, *Konowia*, 11 : 2; LIEFTINCK, 1935, *Misc. Zool. Sum.* 92-93 : 5 (Sumatra); KIMMINS, 1936, *J. Fed. Mal. States Mus.* 18 : 85 (♂ ♀ N. W. Borneo); COOMANS DE RUITER, 1936, *De Trop. Natuur*, 25 : 78 (♂ W. Borneo), fig. 6 (♂ insect); COWLEY, 1937, *Trans. R. Ent. Soc. London*, 86 : 4, fig. 5 (penis, Malaya); LIEFTINCK, 1950, *Treubia*, 20 : 632 footnote (morphol.).

*Libellago mima* LIEFTINCK, 1932, *Konowia*, 11 : 2-4, fig. 1 (♂ abt., Borneo); KIMMINS, 1936, *J. Fed. Mal. States Mus.* 18 : 85 (♂ N. W. Borneo); COWLEY, 1937, *Trans. R. Ent. Soc. London*, 86 : 4; LAIDLAW, 1950, *ibid.* 101 : 268; LIEFTINCK, 1950, *Treubia*, 20 : 632 footnote (morphol.).

*Micromerus semiopacus martinae* SCHMIDT, 1934, *Arch. Hydrob. Suppl.* 13 : 325 (key), pl. 15, fig. 8 (♂ wings, type Sumatra).

*Libellago semiopaca martinac* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 269.

*Libellago semiopaca semiopaca* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 269.

Range. — Malaya.

Sumatra.

Borneo.

Habitat. — Streams and brooks in low country. Apparently a very local species.

### *Libellago snellemanni snellemanni* (SELYS)

*Micromeris snellemanni* SELYS, 1879, Bull. Acad. Belg. (2) 47 : 398-399. — ♂ Central Sumatra.

*Micromeris snellemanni* ALBARDA, 1881, in VETH, Midden Sum. Exped., Neur.: 10-11 (♂ C. Sumatra), pl. 3, fig. 4 a-c (ins., coloured & struct.); SELYS, 1889, Ann. Mus. civ. Genova, 27 : 478-479; KRÜGER, 1898, Stett. ent. Ztg. 59 : 89-90; LIEFTINCK, 1929, Misc. Zool. Sum. 34 : 2 (♂ N. E. Sumatra, notes); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 325, pl. 15, fig. 7 (♂ wings, S. Sumatra).

*Libellago snellemanni* LIEFTINCK, 1932, Konowia, 11 : 2; LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 5 (♂♀ S. Sumatra); COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 78, pl. fig. 7 (♂ ins., Sumatra, coloured); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 4, fig. 9 (penis); LIEFTINCK, 1950, Treubia, 20 : 632 footnote (morphol.).

*Melanocypha snellemanni* FRASER, 1949, Bull. Inst. Roy. Sci. nat. Belg. 25 : 7, 12, fig. 15 (wing detail).

*Melanocypha snellemanni snellemanni* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 269, 276-277, fig. 7 b-c (♂♀ head).

Range. — Sumatra.

Habitat. — Rapids and cascades in the bed of shady forest brooks, 200-650 m.

### *Libellago snellemanni javana* (LAIDLAW)

*Melanocypha snellemanni javana* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 269, 274-276, fig. 7 a, 8 a-b (♂ head, thor. & abd.) — ♂ W. Java.

Range. — West Java (Priangan). Precise locality unknown.

### *Libellago stictica* (SELYS)

*Micromeris stigmatizans* race? *sticticus* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 449. — ♂ Sarawak (N. W. Borneo).

*Micromeris sticticus* SELYS, 1869, Bull. Acad. Belg. (2) 27 : 665; SELYS, 1873, ibid. (2) 36 : 616.

*Libellago stictica* LIEFTINCK, 1932, Konowia, 11 : 10-11 (♂ type redescri.); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 4 (penis, note); LAIDLAW, 1950, ibid. 101 : 268.

Range. — Borneo (northwest and southeast).



**Libellago stigmatizans (SELYS)**

*Micromerus stigmatizans* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 448. — ♂ Mt. Ophir (Malaya).

*Micromerus stigmatizans* KENNEDY, 1920, Ohio J. Sci. 21, pl. 2, fig. 80-81 (penis, Malaya); LAIDLAW, 1923, J. Mal. Br. R. Asiatic Soc. 1 : 329 (key).

*Libellago stigmatizans* LIEFTINCK, 1932, Konowia, 11 : 2, 9-10, 10-11 (key, ♂ Malaya); LIEFTINCK, 1937, Treubia, 16 : 58-59 (♂ Malaya; ♂ Sumatra); LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 268.

Range. — Malaya.

• Sumatra (extreme south).

Habitat. — In Sumatra caught over a small stream, 150 m above sea-level.

**Libellago sumatrana (SELYS)**

• *Micromerus sumatranus* SELYS, 1879, Bull. Acad. Belg. (2) 47 : 397-398. — ♂♀ C. Sumatra.

*Micromerus sumatranus* ALBARDA, 1881, in VETH, Midden Sum. Exped., Neur.: 9-10 (C. Sumatra), pl. 3, fig. 1-2 (♂♀ ins., coloured, ♂ struct.); SELYS, Ann. Mus. civ. Genova, 27 : 479 (Nias, C. Sumatra); RIS, 1915, Tijdschr. Ent. 58 : 6 (♂ Simalur); LAIDLAW, 1926, J. Mal. Br. R. Asiatic Soc. 4 : 228 (♂ Sipora).

*Libellago sumatrana* LIEFTINCK, 1931, Misc. Zool. Sum. 59 : 3 (♂♀ Nias); LIEFTINCK, 1932, Konowia, 11 : 8 (key, W. Java & Sumatra); LIEFTINCK, 1934, Treubia, 14 : 387 (W. Java); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 5 (Sumatra, notes); LIEFTINCK, 1936, De Trop. Natuur, 25, jub.-no.: 107 (W. Java), fig. 11 (photo, ♂ ins.); LIEFTINCK, 1937, Treubia, 16 : 58 (notes, distrib.); LIEFTINCK, 1948, ibid. 19 : 284 (distrib.); LIEFTINCK, 1950, ibid. 20 : 664-665 (phenology).

• *Micromerus aurantiacus sumatranus* SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 325 (key), 326, fig. 12 (♀ thor., S. Sumatra).

Range. — Simalur; Nias; Sipora (Mentawai Is.); Sumatra. Java (west and central south).

Habitat. — Small streams and forest brooks, from sea-level up to 500 m.

**Genus PACHYCYPHA LIEFTINCK**

*Pachycypha* LIEFTINCK, 1950, Treubia, 20 : 631-634.  
(Genotype: *Pachycypha aurea* LIEFTINCK, ♂♀ Borneo)

***Pachycypha aurea* LIEFTINCK**

• *Pachycypha aurea* LIEFTINCK, 1950, Treubia, 20 : 634-638, fig. 1-3 (♂ wings, ♂ head, thor. & abd., ♂♀ app. & apex abd.) — ♂♀ Ampah (S. E. Borneo).

Range. — Borneo (southeast and south).

Habitat. — By slow running streamlets in swampy forest. Prefers

boggy situations and in south Borneo occurs in company with *Libellago hyalina*. Oviposition observed in floating vegetation and in rootlets of shrubs growing on the bank of sluggish brook.

### Genus RHINOCYPHA SELYS

*Rhinocypha* RAMBUR, 1842, Hist. nat. Ins. Névropt.: 232.

(Genotype: *Rhinocypha tinctoria* RAMBUR, ♂ Waigeu I.)

*Heliocypha* FRASER, 1949, Bull. Inst. Roy. Sci. nat. Belg. 25 : 11-12, 16.

(Genotype: *Rhinocypha bisignata* SELYS, ♂ India)

*Aristocypha* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273.

(Genotype: *Rhinocypha quadrimaculata* SELYS, ♂♀ India)

### *Rhinocypha angusta angusta* SELYS

*Rhinocypha angusta* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.) : 62.

— ♂ Sumatra.

*Rhinocypha angusta* SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 212-214 (♂ Sumatra); SELYS, 1879, Bull. Acad. Belg. (2) 47 : 390-392 (♂♀ Sumatra); Mc LACHLAN, 1880, Ent. Mo. Mag. 16 : 205-206 (♂♀ Sumatra); ALBARDA, 1881, in VETH, Midden Sum. Exped., Neur.: 7-9 (♂♀ C. Sumatra), pl. 2, fig. 3-4 (♂♀ ins., coloured + var. & ♂♀ struct.); SELYS, 1889, Ann. Mus. civ. Genova, 27 : 478 (Nias; Sumatra); KENNEDY, 1920, Ohio J. Sci. 21, pl. 2, fig. 76-77 (penis); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2, pl. 3, fig. 1 (♂ wings); RIS, 1927, Zool. Meded. 10 : 6 (♂♀ Sumatra); LIEFTINCK, 1931, Misc. Zool. Sum. 59 : 3 (♂♀ Nias); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 318 (key), 322, pl. 15, fig. 1-4 (♂ wings + id. type *apicalis*), tfig. 3, 8 & 9 (♂♀ thor.); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 15, fig. 53 (penis); LIEFTINCK, 1948, Treubia, 19 : 269 (key).

*Rhinocypha apicalis* KRÜGER, 1898, Stett. ent. Ztg. 59 : 79 (♂ Sumatra).

*Rhinocypha angusta angusta* LIEFTINCK, 1947, Tijdschr. Ent. 88 : 221-222, fig. 2-3 (♂ thor. & abd.); LIEFTINCK, 1948, Treubia, 19 : 269 (key); LIEFTINCK, 1948, ibid.: 284 (Nias, Sumatra).

*Heliocypha angusta angusta* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 277.

Range. — Nias<sup>1)</sup>; Sumatra.

Habitat. — Over shady streams from the coast upwards to 1200 m, and also in cultivated country.

### *Rhinocypha angusta oceanis* LIEFTINCK

*Rhinocypha angusta oceanis* LIEFTINCK, 1947, Tijdschr. Ent. 88 : 220-224, pl. 2, fig. 3 (♂ wings), tfig. 4-5 (♂ thor. & abd.) — ♂♀ Engano I.

*Rhinocypha angusta oceanis* LIEFTINCK, 1948, Treubia, 19 : 284, 286 (Engano).

*Heliocypha angusta oceanis* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 278.

Range. — Engano.

<sup>1)</sup> The Nias form is inseparable from typical *angusta*.



**Rhinoxypha anisoptera SELYS**

*Rhinoxypha anisoptera* SELYS, 1879, Bull. Acad. Belg. (2) 47 : 394-395. — ♂ Sumatra.

*Rhinoxypha anisoptera* KRÜGER, 1898, Stett. ent. Ztg. 59 : 80-81 (♂ ♀ N. E. Sumatra); RIS, 1912, Tijdschr. Ent. 55 : 158-159, pl. 6, fig. 1 (♂ wings, ♂ ♀ E. Java); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 318 (key), 321, pl. 14, fig. 3-4 (♂ ♀ wings, E. Java), tfig. 4-5 (♀ head & thor., E. Java); LIEFTINCK, 1934, Treubia, 14 : 385 (E. Java); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 4 (♂ Sumatra); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 11, fig. 32 (penis, Java); LAIDLAW, 1950, *ibid.* 101 : 272.

Range. — Sumatra (northeast and along the westcoast).

Java (east: from Mt. Wilis eastwards).

Habitat. — Shady forest streams, from sea-level up to 2200 m. Apparently very local in Sumatra.

**Rhinoxypha aurofulgens LAIDLAW**

• *Rhinoxypha aurofulgens* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 242-244. — ♂ ♀ Sarawak (N. W. Borneo).

*Rhinoxypha spec. A* LAIDLAW, 1920, Proc. Zool. Soc. London : 329, 331 (key).

*Rhinoxypha aurofulgens* LAIDLAW, 1936, J. Fed. Mal. States Mus. 18 : 63, pl. 1, fig. 3 (♂ wings, Sarawak); KIMMINS, 1936, *ibid.* 18 : 83 (♂ ♀ Sarawak); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 11, fig. 34 (penis, Borneo); LAIDLAW, 1950, *ibid.* 101 : 272, 277.

Range. — Borneo (north).

• Habitat. — Lowland rivers.

**• Rhinoxypha biseriata biseriata SELYS<sup>1)</sup>**

*Rhinoxypha biseriata* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 446. — ♂ ♀ "Saratoga" (?), Borneo.

*Rhinoxypha biseriata* ALBARDA, 1881, in VETH, Midden Sum. Exped., Neur.: 9, pl. 2, fig. 5 (♂ wing, coloured); LAIDLAW, 1920, Proc. Zool. Soc. London : 328, 331 (key, Borneo); COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 76-77 (♂ W. Borneo), fig. 4 (♂ insect); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 83 (♂ Sarawak); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 15, fig. 52 (penis, N. Borneo).

*Rhinoxypha biseriata anambae* LAIDLAW, 1933, Bull. Raffles Mus. 7 : 99-100 (♂ Anambas), fig. 1 (♂ fotogr., insect).

*Heliocypha biseriata biseriata* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 277.

*Heliocypha biseriata anambae* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 277.

<sup>1)</sup> This species may, perhaps, be reduced to a subspecies of *angusta* when more material from the island groups in the South China Sea is available for study; but for various reasons it is still considered specifically distinct from that species. *R. biseriata* is a variable insect. Examples from east and southeast Borneo are generally darker than those from the western part of the island and absolutely indistinguishable from typical *anambae*. Curiously enough, this applies also to males from the Lingga islands.

- Range. — Anambas.  
Lingga Arch.  
Borneo (universal).

### *Rhinocypha biseriata biforata* SELYS<sup>1)</sup>

- Rhinocypha biforata* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 446. — ♂ ♀ Malaya.  
*Rhinocypha biforata* ALBARDA, 1881, in VETH, Midden Sum. Exped., Neur.: 9, pl. 2, fig. 6 (♂ wing, coloured); LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 88 (Kelantan); LAIDLAW, 1903, Fasc. Malayenses, Zool. 1 : 196 (♂ Jalor); WILLIAMSON, 1904, Proc. U.S. Nat. Mus. 28 : 179, fig. 12 (♂ wings, Lower Siam); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 6, 13, fig. 44 (penis Mergui, as *beesoni*), fig. 45 (penis India, *err. pro* Malaya).  
*Heliocypha biforata biforata* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 277.

- Range. — Siam; Malaya.  
Bangka; Billiton.

### *Rhinocypha cognata* KIMMINS

- Rhinocypha cognata* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 84-85, fig. 8 (♂ abd.) — ♂ Mt. Dulit, Sarawak (N. W. Borneo).  
*Rhinocypha cognata* COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 10, fig. 29 (penis, *s. nom.*); LAIDLAW, 1950, *ibid.* 101 : 270, 277.

- Range. — Borneo (Sarawak).  
Habitat. — Over a forest stream on Mt. Dulit, apparently in low country.

### *Rhinocypha cucullata* SELYS

- Rhinocypha cucullata* SELYS, 1873, Bull. Acad. Belg. (2) 35 : 492-493. — ♂ ♀ Labuan (N. Borneo).  
*Rhinocypha cucullata* LAIDLAW, 1920, Proc. Zool. Soc. London : 329 (♂ N. Borneo), 331 (key); LAIDLAW, 1923, J. Mal. Br. R. Asiatic Soc. 1 : 327; LAIDLAW, 1936, J. Fed. Mal. States Mus. 18 : 63, pl. 1, fig. 4 (♂ wings); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 11, fig. 33 (penis); LAIDLAW, 1950, *ibid.* 101 : 272, 277.

- Range. — Borneo (north and southeast).  
Habitat. — Streams in low country.

<sup>1)</sup> Examples from the Shan States and south Burma (Maymyo and Mergui), described as *delimbata* SELYS and *beesoni* FRASER, respectively, are scarcely racially distinct from Malayan *biforata*. The Bangka and Billiton forms (which are not alike) have the opaque wing-colour considerably more extensive in the ♂ and the hyaline fenestrae on the posterior wing removed further proximad than Malayan examples. They are in fact rather intermediate in this respect between Bornean *biseriata* and Malayan *biforata* and show no approach towards *angusta*, which is confined to Sumatra and the island chain to the west of it.



**Rhinocypha fenestrata fenestrata (BURMEISTER)**

*Calopteryx fenestrata* BURMEISTER, 1839, Handb. Ent. 2 : 826. — ♂ Java.

*Rhinocypha vitrella* & *infumata* RAMBUR, 1842, Hist. nat. Ins. Névropt.: 234 & 237 (Java).

- *Rhinocypha fenestrata* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.): 62-63 (♂ ♀ Java); SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 216-219, pl. 8, fig. 13 (lab.); CALVERT, 1898, Trans. Amer. Ent. Soc. 25 : 47 (type); RIS, 1912, Tijdschr. Ent. 55 : 158 (Java); FRASER, 1926, Treubia, 8 : 484 (Java, not Sumatra!); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 318 (key), 322-323, pl. 15, fig. 5 (♂ wings), tfig. 6-7 (♀ head & thor.); LIEFTINCK, 1934, Treubia, 14 : 385-386 (bionomics); COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 77 (Java), pl. fig. 4 (♂ ins., coloured); LIEFTINCK, 1936, *ibid.* 25, jub.-no.: 109 (Java), fig. 13 (photogr. ♂ ins.); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 13, fig. 43 (penis).

*Rhinocypha fenestrata fenestrata* LIEFTINCK, 1947, Tijdschr. Ent. 88 : 217-220, fig. 1 (larva), pl. 3, fig. 1-4 (♂ wings); LIEFTINCK, 1953, *Ideā*, 9 : 53 (Panaitan).

*Heliocypha fenestrata fenestrata* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 277.

Range. — Panaitan; Java (universal).

Habitat. — Shady lowland and hill forest streams, up to about 1000 m; also in cultivated areas.

**Rhinocypha fenestrata cornelii LIEFTINCK**

*Rhinocypha fenestrata cornelii* LIEFTINCK, 1947, Tijdschr. Ent. 88 : 218-220, pl. 2, fig. 1 (♂ wings). — ♂ ♀ Bali.

*Heliocypha fenestrata cornelii* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 277.

Range. — Bali (south and southwest).

Habitat. — Over forest streams, 200-700 m.

**Rhinocypha fenestrella RAMBUR**

*Rhinocypha fenestrella* RAMBUR, 1842, Hist. nat. Ins. Névropt.: 236. — ♂ ?Malaya.

*Rhinocypha fenestrella* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.): 60 (♂ ♀ Penang); SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 204-206; LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 88 (Kelantan, Wellesley); LAIDLAW, 1902, Fasc. Malayenses, Zool. 1 : 195-196 (♂ ♀ Malaya); WILLIAMSON, 1904, Proc. U.S. Nat. Mus. 28 : 173 (key), 178-179, fig. 11 (♂ wings, Perak); FRASER, 1927, J. Bombay N. H. Soc. 32 : 194 (Borneo: error!); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 181-182 (Siam, Malaya); LAIDLAW, 1934, *ibid.* 17 : 552 (Malay States); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 13, fig. 41 (penis, Malaya); FRASER, 1942, Proc. R. Ent. Soc. London (B) 11 : 98 (Malaya; Penang).

*Aristocypha fenestrella* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 277.

Range. — Siam; Penang; Malaya.

Habitat. — In the Malay States from near the coast up to about 1700 m, over shady rivulets in the forest.

**Rhincocypha heterostigma RAMBUR**

*Rhincocypha heterostigma* RAMBUR, 1842, Hist. nat. Ins. Névropt.: 236. — ♂ ♀ Java.

*Rhincocypha heterostigma* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.): 63; SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 221-222 (♂ ♀ Java); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 318 (key), 320-321, pl. 14, fig. 5-7 (♂ wings), tfig. 1 (♂ thor.); LIEFTINCK, 1934, Treubia, 14 : 386 (bionomics); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 12, fig. 37 (peris, Java).

*Rhincocypha io* FRASER<sup>1)</sup>, 1926, Treubia, 8 : 485-486 (♂ "Sumatra" *err. pro* Java).

*Rhincocypha selysi* LIEFTINCK<sup>1)</sup>, 1934, Treubia, 14 : 386-387 (W. Java).

*Rhincocypha heterostigma heterostigma* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 272, 277.

*Rhincocypha heterostigma io* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 272, 278.

Range. — Java (as far east as Mt. Telomojo in Semarang-Kedu).

Habitat. — Wells, spring-fed marshes and brooks in dense forest, from 600 m to about 1600 m.

**Rhincocypha humeralis SELYS**

*Rhincocypha humeralis* SELYS, 1873, Bull. Acad. Belg. (2) 35 : 488-489. — ♂ ♀ Labuan (N. Borneo).

*Rhincocypha eximia* SELYS<sup>2)</sup>, 1873, Bull. Acad. Belg. (2) 35 : 488 (♂ Borneo).

*Rhincocypha humeralis* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 244-245 (♂ ♀ Borneo; ♀ Banguay); LAIDLAW, 1936, *ibid.* 18 : 63, pl. 1, fig. 5 (♂ ♀ wings Balabac); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 9, fig. 23 (peris, Balabac); LAIDLAW, 1950, *ibid.* 101 : 271, 277.

Range. — Borneo; Banguay.

Habitat. — Forest streams in low country.

**Rhincocypha mariae LIEFTINCK**

*Rhincocypha mariae* LIEFTINCK, 1930, Treubia, 12 : 136-138. — ♂ S. Sumatra.

*Rhincocypha mariae* SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 318 (key), 323, pl. 15, fig. 6 (♂ wings), tfig. 2 (♂ thor.); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 15, fig. 49 (penis); LIEFTINCK, 1948, Treubia, 19 : 269-270 (key; ♀ descr.).

*Heliocypha mariae* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 278.

<sup>1)</sup> *R. io* was based on a ♂ of the typical (mountain) form of *heterostigma*. Javan "selysi" is a very dark form of the same species, confined to the lower mountain zone and probably separable as a subspecies. Owing to the deforestation of most of west and mid Java, our material from the hill-country is scanty and the subspecific identification of insects from these areas is still uncertain. SCHMIDT's wing-photographs clearly demonstrate the existing variations, but his "Ostjava-Form" originates from west Java, Sukabumi being situated on the foot of the same mountain whence his "Westjava-Form" was recorded.

<sup>2)</sup> Among a series of males from southeast Borneo are examples in which the extent of the opaque wing-colour is similar to the type of *eximia* SELYS. Although the name *eximia* has page-priority over *humeralis*, we have preferred using the latter name.



Range. — Sumatra (south).

Habitat. — Hill forest streams near Lake Ranau, 400-600 m.

### **Rhinocypha moultoni LAIDLAW**

• *Rhinocypha moultoni* LAIDLAW, 1915, Proc. Zool. Soc. London : 35-37. — ♂ ♀ Mt. Kinabalu (N. Borneo).

*Rhinocypha moultoni* LAIDLAW, 1920, Proc. Zool. Soc. London : 328-329, 331, tfig. 1 (♂ ♀ abd.); LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 550 (Mt. Kinabalu); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 9, fig. 24 (penis, type); LAIDLAW, 1950, *ibid.* 101 : 270, 278.

Range. — Borneo (north).

Habitat. — Only known from Mt. Kinabalu, about 1000 m above sea-level.

### **Rhinocypha nubecula LIEFTINCK**

• *Rhinocypha nubecula* LIEFTINCK, 1948, Treubia 19 : 266-268, 269-270 (key), fig. 16 (♂ thor.) — ♂ ♀ N. Sumatra.

*Heliocypha nubecula* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 278.

Range. — Sumatra (north).

Habitat. — Near lake Takengon (Takegeun), 1250 m alt.

### **Rhinocypha pallidifrons RIS**

• *Rhinocypha pallidifrons* RIS, 1927, Zool. Meded. 10 : 9-10, fig. 3 (♀ wings). — ♀ Central Sumatra.

• Range. — Sumatra (central west).

Habitat. — Only known from Mt. Kerintji (Peak of Indrapura), near Tanangtalu, 1000 m. The ♂ remains unknown.

### **Rhinocypha pelops LAIDLAW**

*Rhinocypha pelops* LAIDLAW, 1936, J. Fed. Mal. States Mus. 18 : 60-61, pl. 1, fig. 1 (♂ wings). — ♂ ♀ Perak (Malaya).

*Rhinocypha pelops* COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 12, fig. 36 (penis, type, *s. nom.*); LAIDLAW, 1950, *ibid.* 101 : 272, 278.

Range. — Malaya.

Habitat. — Within our faunal limits only known from near Ipoh on Mt. Kledang (about 950 m), in Perak. Also reported from Tenasserim.

### **Rhinocypha perforata perforata (PERCHERON)**

*Agrion perforatus* PERCHERON, 1835, Gen. Ins., Neur. t. 2. — ♂ Cochín-China.

Range. — Extra-limital.]

**Rhinocypha perforata limbata SELYS**

*Rhinocypha perforata* var. *limbata* SELYS, 1879, Bull. Acad. Belg. (2) 47 : 392-393.

— ♂ E. Burma.

*Rhinocypha inas* LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 88-89, pl. 6, fig. 6 (♂ insect, Malaya).

*Rhinocypha apicalis* LAIDLAW, 1903, Fasc. Malayenses, Zool. 1 : 196 (♂ Jor in Perak).

*Rhinocypha perforata* RIS, 1916, Suppl. Entom. 5 : 4-5, pl. 1, fig. 1 (♂ wings, Malaya); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 4 (♂ Sumatra)<sup>1)</sup>.

*Rhinocypha perforata limbata* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 181 (♂ Lower Siam; ♂♀ Pahang).

*Rhinocypha limbata* COWLEY, 1937, Trans. R. Ent. London, 86 : 10, fig. 28 (penis, type *inas*).

*Heliocypha perforata limbata* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 273, 278.

Range. — Siam; Malaya.

Habitat. — Prefers the wider streams in the foothills, up to 500 m.

**Rhinocypha selysi KRÜGER**

*Rhinocypha selysi* KRÜGER, 1898, Stett. ent. Ztg. 59 : 81-83. — ♂♀ N. E. Sumatra.

*Rhinocypha selysi* RIS, 1927, Zool. Meded. 10 : 6-7 (♂♀ C. W. Sumatra); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 317-318 (key), 319-320, pl. 14, fig. 1-2 (♂♀ wings, N. E. Sumatra); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 11, fig. 35 (penis, ?Sumatra); LAIDLAW, 1950, *ibid.* 101 : 272, 278.

Range. — Sumatra (universal).

Habitat. — Spring-fed pools, brooks and cascades in forested areas, 100-800 m.

**Rhinocypha spinifer LAIDLAW**

*Rhinocypha spinifer* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 241-242. — ♂ Sarawak (N. W. Borneo).

*Rhinocypha spec. B* LAIDLAW, 1920, Proc. Zool. Soc. London : 330, 331 (key), tfig. 2 (♂ abd., Mt. Batu Lawi).

*Rhinocypha spinifer* LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 550 (Mt. Batu Lawi, Sarawak); KIMMINS, 1936, *ibid.* 18 : 82-83 (♂♀ N. W. Borneo); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 8, fig. 21 (penis); LAIDLAW, 1950, *ibid.* 101 : 270.

Range. — Borneo (northwest).

Habitat. — Forest streams in the Sarawak mountains (Mt. Batu Lawi and Mt. Dulit), from 800 m to 1100 m.

<sup>1)</sup> The Sumatran record needs confirmation. Based on a ♂ in the Hamburg Museum labelled "Sumatra, B. JACHAN". Other specimens from the same source are from Kuala Kangsar, Perak.



**Rhinocypha stygia FÖRSTER**

*Rhinocypha stygia* FÖRSTER, 1897, Ann. Soc. ent. Belg. 41 : 210-211. — ♂ ♀ Mt. Kinabalu (N. Borneo).

*Rhinocypha stygia* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 83-84 (notes; cf. *cognata*); LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 270, 278.

Range. — Borneo (north).

Remarks. — Known only from the type locality.

**Rhinocypha xanthe RIS**

*Rhinocypha xanthe* RIS, 1927, Zool. Meded. 10 : 7-8, fig. 2 (♀ wings). — ♂ ♀ W. Sumatra.

*Rhinocypha xanthe* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 270, 278.

Range. — Sumatra (central west).

Habitat. — Known only from Mt. Kerintji (Peak of Indrapura) and surrounding mountain areas, 735-1400 m.

**Genus SUNDACYPHA LAIDLAW**

*Sundacypha* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 272, 278.

(Genotype: *Rhinocypha petiolata* SELYS, ♀ Malaya)

**Sundacypha petiolata (SELYS)**

*Rhinocypha petiolata* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 447. — ♀ Malaya.

*Rhinocypha karschi* KRÜGER, 1898, Stett. ent. Ztg. 59 : 83-85 (♂ N. E. Sumatra); LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 90 (♂ Kelantan); LAIDLAW, 1920, ibid.: 328, 331 (♂ N. W. Borneo).

*Micromeris robropictus* MARTIN, 1902, Bull. Mus. Hist. nat. 7 : 508 (♂ Borneo).

*Calocypha karschi* LAIDLAW, 1934, Stylops, 3 : 99-101 (♂ W. Borneo); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 323, pl. 14, fig. 8 (♂ wings, N. E. Sumatra), tfig. 10 (♂ thorax, id.).

*Calocypha petiolata* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 81-82 (♂ N. W. Borneo); LAIDLAW, 1936, ibid. 18 : 63-64; COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 77 (♂ W. Borneo), pl. fig. 5 (♂ ins., coloured); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 4-5, fig. 18 (penis, Borneo).

*Sundacypha petiolata* LAIDLAW, 1950, Trans. R. Ent. Soc. London, 101 : 272, 278.

Range. — Malaya.

Sumatra.

Borneo.

Habitat. — Breeds alike in sluggish forest brooks and rivulets with swiftly flowing water, but invariably occurs in dense lowland forest.

Genus **RHINONEURA** LAIDLAW*Rhinoneura* LAIDLAW, 1915, Proc. Zool. Soc. London : 33.(Genotype: *Rhinoneura villosipes* LAIDLAW, ♂ Borneo)**Rhinoneura villosipes** LAIDLAW*Rhinoneura villosipes* LAIDLAW, 1915, Proc. Zool. Soc. London : 33-35, tfig. 4 & 5 A (♂ wings & femur). — ♂ Mt. Kinabalu (N. Borneo).*Rhinoneura villosipes* LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 550 (Mt. Kinabalu); KIMMINS, 1936, *ibid.* 18 : 79, fig. 6 B & D (♂ thor. & abd.); COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 10, fig. 30 (penis); LAIDLAW, 1950, *ibid.* 101 : 270.

Range. — Borneo (north).

Habitat. — Only known from Mt. Kinabalu, about 1100 m.

**Rhinoneura caerulea** KIMMINS*Rhinoneura caerulea* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 79-81, fig. 6 A, C & 7 a-c (♂ thor., abd. & app.; ♀ thor. & genit.). — ♂ ♀ N. W. Borneo.*Rhinoneura caerulea* COWLEY, 1937, Trans. R. Ent. Soc. London, 86 : 10, fig. 31 (penis, *s. nom.*); LAIDLAW, 1950, *ibid.* 101 : 270.

Range. — Borneo (northwest).

Habitat. — Known only from forest-streams on Mt. Dulit in Sarawak, 1200-1350 m.

Family **EPALLAGIDAE**Genus **EUPHAEA** SELYS*Euphaea* SELYS, 1840, Mon. Lib. Eur. : 200; COWLEY, 1934, Ent. Mo. Mag. 70 : 242.(Genotype: *Euphaea variegata* RAMBUR, ♂ Java)*Altophaea* FRASER, 1929, J. Bombay N. H. Soc. 33 : 288.(Genotype: *Euphaea ochracea* SELYS, ♂ Malaya)*Indophaea* FRASER, 1929, J. Bombay N. H. Soc. 33 : 293-294.(Genotype: *Euphaea dispar* RAMBUR, ♂ ♀ India)**Euphaea aspasia** SELYS*Euphaea aspasia* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.) : 52 (*parv.* not ♀). — ♂ Sumatra.*Euphaea aspasia* SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 173-175 (*pars*, not ♀), pl. 13, fig. 6 (♂ app., Sumatra); SELYS, 1873, Bull. Acad. Belg. (2) 35 : 485; SELYS, 1879, *ibid.* (2) 47 : 372; SELYS, 1889, Ann. Mus. civ. Genova, 27 : 474-475 (♂ Sumatra, Nias); KRÜGER, 1898, Stett. ent. Ztg. 59 : 76 (♂ ♀ Sumatra); RIŠ, 1915, Tijdschr. Ent. 58 : 6 (♂ ♀ Simalur); LIEFTINCK, 1931, Misc. Zool. Sum. 59 : 3 (♂ Nias); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 328 (key), 330, pl. 16, fig. 5-6 (♂ wings, Sumatra), tfig. 14, 15, 17 (♂ app., penis vesicle, thor., Sumatra).*Pseudophaea aspasia* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 298 (key).



Range. — Simalur; Nias; Sumatra (universal).

Habitat. — Lowland and hill forest, over tumbling brooks and stony rivers, up to 1200 m. (in north Sūmatra), but most frequent at 400-500 m.

**Euphaea basalis (LAIDLAW)**

*Pseudophaea basalis* LAIDLAW, 1915, Proc. Zool. Soc. London : 32. — ♂ Mt. Kinabalu (N. Borneo).

*Pseudophaea basalis* LAIDLAW, 1920, Proc. Zool. Soc. London : 326, 327 (key, ♂ N. Borneo); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 298 (key).

*Euphaea basalis* RIS, 1930, Mitt. Münch. Ent. Ges. 20 : 88 (key), 89, LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 550 (Mt. Kinabalu).

Range. — Borneo (north).

Habitat. — Only known from Mt. Kinabalu, about 1100 m.

**Euphaea bocki MCLACHLAN**

*Euphaea bocki* MCLACHLAN, 1880, Ent. Mo. Mag. 16 : 204-205. — ♂ Central Sūmatra.

*Euphaea bocki* SELYS, 1889, Ann. Mus. civ. Genova, 27 : 476-478 (♂ Sumatra); KRÜGER, 1898, Stett. ent. Ztg. 59 : 77 (♂ N. E. Sumatra); RIS, 1927, Zool. Meded. 10 : 5 (♂ C. W. Sumatra); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 328 (key), 330 (♂♀ N. E. Sumatra), pl. 16, fig. 7 (♂ wings), tfig. 15 & 18 (penis vesicle & ♀ thor.).

*Pseudophaea bocki* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 299.

Range. — Sumatra (northeast and central west).

Habitat. — Rocky forest streams, from near sea-level up to about 1000 m.

**Euphaea impar SELYS**

*Euphaea impar* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 441-442. — ♂♀ Mt. Ophir (Malaya).

*Euphaea inaequipar* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 442 (♂ Sarawak); RIS, 1930, Mitt. Münch. Ent. Ges. 20 : 85 (key), 85-86 (♂ Sarawak); LAIDLAW, 1933, Bull. Raffles Mus. 18 : 78 (♂ Sarawak); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 78 (♂ Sarawak).

*Euphaea impar* KRÜGER, 1898, Stett. ent. Ztg. 59 : 78 (♂ N. E. Sumatra); LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 87 (♂ Kelantan); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 298, 299 (♂ Anambas); RIS, 1930, Mitt. Münch. Ent. Ges. 20 : 85 (key), 85-86 (♂ Mt. Ophir, Malaya); LIEFTINCK, 1940, Treubia, 17 : 341-343 (full synonymy, distrib., & c).

*Pseudophaea impar inaequipar* LAIDLAW, 1920, Proc. Zool. Soc. London : 327 (♂ Sarawak); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 299.

*Pseudophaea impar impar* LAIDLAW, 1920, Rec. Ind. Mus. 19 : 27 (key); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 299.

*Euphaea impar impar* LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 3 (♂ S. Sumatra).

*Euphaea impar inaequipar* COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 73-74, fig. 2 (♂♀ photo, W. Borneo).

Range. — Malaya; Anambas.  
Sumatra; Bangka.  
Borneo.

Habitat. — Shady forest brooks, usually in low country, and not found above 500 m.

### **Euphaea laidlawi** KIMMINS

*Euphaea laidlawi* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 77-78, fig. 5 c (penis vesicle). — ♂ Sarawak (N. W. Borneo); ♂ Palawan.

Range. — Borneo (north and northwest).  
(Also found in Palawan.)

Habitat. — Apparently in low country.

### **Euphaea masoni** SELYS

*Euphaea masoni* SELYS, 1879, Bull. Acad. Belg. (2) 47 : 377. — ♂ Tenasserim.

*Euphaea masoni* LAIDLAW, 1903, Fasc. Malayenses, Zool. 1 : 194 (♂ Jalor, S. Siam); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13, fig. 15 (penis vesicle).

*Pseudophaea masoni* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 299 (Jalor, notes).

Range. — Siam.

(A species occurring in Assam, Burma, and Indo-China; within the limits of the present fauna apparently not found further south than Mabek in Jalor.)

### **Euphaea modigliani** SELYS

*Euphaea modigliani* SELYS, 1898, Ann. Soc. ent. Belg. 42 : 336-337. — ♂ Mentawai Is.

*Euphaea modigliani* RIS, 1927, Zool. Meded. 10 : 5 (♂ W. Sumatra); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 327 (key), pl. 16, fig. 1 (♂ wings, W. Sumatra).

Range. — Mentawai Is. (no precise locality); Sumatra (west).

### **Euphaea ochracea ochracea** SELYS

*Euphaea ochracea* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 443. — ♂ Mt. Ophir (Malaya).

*Euphaea ochracea* LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 37 (♂ ♀ Malaya); LAIDLAW, 1903, Fasc. Malayenses, Zool. 1 : 193-194 (♂ Malaya); NEEDHAM, 1903, Proc. U.S. Nat. Mus. 26, pl. 51, fig. 1 (wing); WILLIAMSON, 1904, ibid. 28 : 181-182, fig. 14 (♂ wings, Siam).

*Pseudophaea ochracea* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 297 (♂ Malaya).

*Euphaea ochracea ochracea* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 180 (Siam; Malaya); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 4 (♂ Sumatra)<sup>1)</sup>.

*Allophaea ochracea* FRASER, 1942, Proc. R. Ent. Soc. London (B) 11 : 98.

<sup>1)</sup> One questionable record, based on 3 ♂ and 1 ♀ in the Hamburg Museum labelled "Sumatra, B. JACHAN", along with a ♂ from the same source indicated Kuala Kangsar, Perak.



Range. — Siam; Malaya.

Habitat. — In the Malay States of Pahang, Perak and Selangor found in localities between 100 and 400 m.

### *Euphaea subcostalis* SELYS

*Euphaea subcostalis* SELYS, 1873, Bull. Acad. Belg. (2) 35 : 483-484. — ♂ Labuan (N. Borneo).

*Pseudophaea subcostalis* LAIDLAW, 1915, Proc. Zool. Soc. London : 32-33 (♂ N. Borneo); LAIDLAW, 1920, *ibid.*: 326 (key); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 298 (key).

*Euphaea subcostalis* RIS, 1930, Mitt. Münch. Ent. Ges. 20 : 88 (key), 88-89 (♂ N. W. & N. Borneo); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 326, pl. 17, fig. 3 (♂ wings), tfig. 15 (penis vesicle); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 77 (♂ Sarawak; ♂ ?Malacca), fig. 4 b & 5 b (♂ app. & penis vesicle, Sarawak).

Range. — ? Malaya.

Borneo (universal).

Habitat. — Rocky streams and brooks, from near sea-level up to about 600 m.

### *Euphaea subnodalis* (LAIDLAW)

*Pseudophaea subnodalis* LAIDLAW, 1915, Proc. Zool. Soc. London : 31-32. — ♂ ♀ Mt. Kinabalu (N. Borneo).

*Pseudophaea subnodalis* LAIDLAW, 1920, Proc. Zool. Soc. London : 326, 327 (key); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 298 (key).

*Euphaea subnodalis* RIS, 1930, Mitt. Münch. Ent. Ges. 20 : 88 (key), 89 (♂ Kinabalu); LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 550 (Mt. Kinabalu); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 326, pl. 17, fig. 4 (♂ wings, *id.*); LIEFTINCK, 1940, Treubia, 17 : 343-344 (♂ N. Borneo, notes), fig. 2 (penis vesicle).

Range. — Borneo (north).

Habitat. — Only known from the type locality, about 1000 m.

### *Euphaea tricolor* SELYS

*Euphaea tricolor* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 442-443. — ♂ Sarawak (N. W. Borneo).

*Pseudophaea tricolor* LAIDLAW, 1920, Proc. Zool. Soc. London : 326, 327 (key); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 298 (key).

*Euphaea tricolor* RIS, 1930, Mitt. Münch. Ent. Ges. 20 : 87 (key), 88 (♂ Borneo); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 76-77 (♂ Sarawak), fig. 4 a & 5 a (♂ app. & penis vesicle); COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 74, fig. 2 (♂ fotogr., W. Borneo), pl. fig. 3 (♂ ins., coloured).

Range. — Borneo (universal).

Habitat. — Open sunny streams at low elevations.

**Euphaea variegata** RAMBUR

*Euphaea variegata* RAMBUR, 1842, Hist. nat. Ins. Névropt.: 229. — ♂ Java.

*Euphaea variegata* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.): 52 (♂ Java); SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 175-178, pl. 8, fig. 11 (lab.), pl. 13, fig. 7 (♂ app.); McLACHLAN, 1880, Ent. Mo. Mag. 16 : 205 (♂ ♀ Sumatra); SELYS, 1889, Ann. Mus. civ. Genova, 27 : 475-476 (♂ Sumatra, ♂ ♀ Java); RIS, 1912, Tijdschr. Ent. 55 : 158, 168-177 (larva), pls. 6-8 (larval struct., Java); RIS, 1927, Zool. Meded. 10 : 6 (♂ ♀ Sumatra); LIEFTINCK, 1934, Treubia, 14 : 384-385 (distrib., bionomics); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 4 (♂ ♀ S. Sumatra); COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 73 (Java), pl. fig. 2 (♂ ins., coloured); LIEFTINCK, 1936, ibid. 25, jub.-no.: 107 (Java), fig. 19 (photogr., ♂ ins.).

*Euphaea intermedia* KRÜGER, 1898, Stett. ent. Ztg. 59 : 76-77 (♂ N. E. Sumatra).

*Pseudophaea variegata* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 298 (key).

*Euphaea v. variegata* + *v. intermedia* SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 327 (key), 328-329, pl. 16, fig. 2-4 (♂ wings, Java & Sumatra), tfig. 13 & 16 (♂ app. & thor., Java).

*Euphaea variegata variegata* LIEFTINCK, 1953, Idea, 9 : 53 (Panaitan); LIEFTINCK,

1953, Verh. Naturf. Ges. Basel, 64 : 126, 127, 138-139 (Bali, notes variation & distrib.).

Range. — Sumatra (not north).

Panaitan; Java; Bali.

Habitat. — Rocky streams in wooded districts, from sea-level up to about 600 m; also in second growth forest.

**Genus DYSPHAEA SELYS**

*Dysphaea* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.) : 53-54.

(Genotype: *Dysphaea dimidiata* SELYS, ♂ Java)

**Dysphaea dimidiata** SELYS

*Dysphaea dimidiata* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.) : 53-54. — ♂ Java.

*Dysphaea dimidiata* SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 185-187 (♂ Java), pl. 5, fig. 4 (wing), pl. 14, fig. 4 (♂ app.); SELYS, 1879, Bull. Acad. Belg.

(2) 47 : 378-379 (♀ Sumatra); ALBARDA, 1881, in VETH, Midden Sum. Exped., Neur.: 6-7 (C. Sumatra), pl. 2, fig. 1-2 (♂ ♀ ins. coloured, & ♂ ♀ struct.); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 300 (Pahang); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 180 (♂ ♀ Pahang, note); SCHMIDT, 1934, Arch. Hydrob.

Suppl. 13 : 330-331 (♂ S. Sumatra), pl. 16, fig. 8 (♂ wings, N. W. Borneo); LIEFTINCK, 1934, Treubia, 14 : 385 (W. Java); LIEFTINCK, 1935, Misc. Zool. Sum.

92-93 : 4 (Sumatra); COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 74-75 (♂ ♀ Borneo; Java, notes), fig. 3 (photogr. ♂ ♀ ins., W. Borneo); LIEFTINCK,

1936, ibid. 25, jub.-no.: 109 (W. Java), fig. 14 (photo ♂ ins.); LIEFTINCK, 1948,

Verslag 79e winterverg. Ned. Ent. Ver. (publ. 15.v.1948), Tijdschr. Ent. 90 (1949) : ix-xi (Java, larva, bionomics); LIEFTINCK, 1950, Treubia, 20 : 664-665

(phenology).



*Dysphaea limbata* SELYS, 1859, Bull. Acad. Belg. (2) 7 : 443-444 (♂♀ Malaya); SELYS, 1869, *ibid.* (2) 27 : 660; SELYS, 1873, *ibid.* (2) 35 : 487 (♀ Singapore, ♂ Borneo); LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 88 (♂ Malaya); WILLIAMSON, 1904, Proc. U.S. Nat. Mus. 28 : 182-183 (♂ Lower Siam); RIS, 1911, Ann. Soc. ent. Belg. 55 : 232-233 (♂ Malaya); KENNEDY, 1920, Ohio J. Sci. 21, pl. 1, fig. 40-41 (penis); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 78 (♂♀ Sarawak).

*Dysphaea semilimbata* SELYS, 1873, Bull. Acad. Belg. (2) 35 : 486 (♂ Borneo).

Range. — Siam; Malaya.  
Sumatra; Billiton.  
Java (west).  
Borneo.

Habitat. — Shady rivers and slow flowing streams in low country.  
Not found above 600 m.

### *Dysphaea lugens* SELYS

*Dysphaea lugens* SELYS, 1873, Bull. Acad. Belg. (2) 35 : 485-486. — ♂ S. Borneo.

*Dysphaea lugens* RIS, 1911, Ann. Soc. ent. Belg. 55 : 232-233 (♂♀ W. Borneo); KENNEDY, 1920, Ohio J. Sci. 21, pl. 1, fig. 32-33 (penis); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 300; COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 76 (♂♀ W. Borneo, notes), fig. 3 (photogr. ♂ ins.).

Range. — Borneo (universal).

Habitat. — Exposed lowland streams and rivers; much scarcer than *dimidiata*, but common over the wide sluggish streams of the southern alluvial plains, occasionally keeping company with *dimidiata*.

## Family AGRIIDAE (CALOPTERYGIDAE auct.)

### Genus ECHO SELYS

*Echo* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.): 19.

(Genotype: *Echo margarita* SELYS, ♀ ?China)

*Climacobasis* LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 85-86, pl. 6, fig. 5.

(Genotype: *Climacobasis lugens* LAIDLAW, ♂ Malaya = *Echo modesta* LAIDLAW, ♀ Malaya)

### *Echo modesta* LAIDLAW

*Echo modesta* LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 84-85, pl. 5, fig. 6 (♀ insect).

— ♀ Kelantan (Malaya).

*Climacobasis lugens* LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 85-86 (Kelantan, Malaya), pl. 6, fig. 5 (♂ wing).

*Echo (Climacobasis) modesta* LAIDLAW, 1903, Fasc. Malayenses, Zool. 1 : 191-192 (Bukit Besar, Nawngchik).

*Climacobasis modesta* WILLIAMSON, 1904, Proc. U.S. Nat. Mus. 28 : 186-187; fig. 17 a-b (♂♀ wings, Lower Siam); KENNEDY, 1920, Ohio J. Sci. 21, pl. 2, fig. 56-57 (penis); LAIDLAW, 1923, J. Mal. Br. R. Asiatic Soc. 1 : 331; LAIDLAW, 1931,

J. Fed. Mal. States Mus. 16 : 179; LAIDLAW, 1934, *ibid.* 17 : 552 (Pahang);  
FRASER, 1935, *Rec. Ind. Mus.* 37 : 332 (♀ Langkawi I., Kedah).

Range. — Siam; Malaya; Langkawi I. (off? Kedah).

Habitat. — Jungle streams, up to 1300 m.

### *Echo uniformis* SELYS

*Echo ? uniformis* SELYS, 1879, *Bull. Acad. Belg.* (2) 47 : 357. — ♂ C. Sumatra.

*Echo uniformis* SELYS, 1898, *Ann. Soc. ent. Belg.* 42 : 335-336 (♂ ♀ C. Sumatra);  
KRÜGER, 1898, *Stett. ent. Ztg.* 59 : 72-74 (♂ ♀ N. E. Sumatra); LAIDLAW, 1923,  
*J. Mal. Br. R. Asiatic Soc.* 1 : 331; LIEFTINCK, 1935, *Misc. Zool. Sum.* 92-93 : 3  
(Sumatra, mountains); LIEFTINCK, 1948, *Treubia*, 19 : 284, 286 (Engano).

Range. — Engano; Sumatra.

Habitat. — Submontane and montane, by small torrential streams in  
shady situations, from 600 m to 1700 m, and sometimes keeping  
company with *Vestalis amoena* and *lugens*.

### Genus VESTALIS SELYS

*Vestalis* SELYS, 1853, *Bull. Acad. Belg.* 20, Annexe (Syn. Calopt.): 24.

(Genotype: *Calopteryx luctuosa* BURMEISTER, ♂ ♀ Java)

*Vestinus* KENNEDY, 1920, *Ohio Journ. Sci.* 21 : 83.

(Genotype: *Calopteryx gracilis* RAMBUR, ♂ ♀ India)

### *Vestalis amoena* SELYS

*Vestalis amoena* SELYS, 1853, *Bull. Acad. Belg.* 20, Annexe (Syn. Calopt.): 25-26.  
— ♂ ♀ Sumatra.

*Vestalis amoena* SELYS, & HAGEN, 1854, *Mém. Soc. Sci. Liège*, 9 : 82-83 (Java, error  
= Penang), pl. 8, fig. 6 (antenna); SELYS, 1873, *Bull. Acad. Belg.* (2) 35 : 475  
(♂ ♀ Labuan, N. Borneo); ALBARDA, 1881, in VETH, *Midden Sum. Exped., Neur.*:  
6 (Sumatra); HAGEN, 1887, *Abh. Zool.-bot. Ges. Wien*, 37 : 648 (♀ S. Borneo);  
LAIDLAW, 1902, *Proc. Zool. Soc. London*, 1 : 87 (♂ ♀ Malaya); NEEDHAM, 1903,  
*Proc. U.S. Nat. Mus.* 26 : 753, fig. 41 (wing); LAIDLAW, 1903, *Fasc. Malayenses*,  
*Zool.* 1 : 193 (♂ ♀ Malaya); SCHMIDT, 1915, *Zool. Jahrb.* 39, pl. 11, fig. 45  
(penis); LAIDLAW, 1915, *Proc. Zool. Soc. London* : 30-31 (♂ ♀ N. Borneo); LAID-  
LAW, 1920, *ibid.*: 326 (Kinabalu, N. Borneo); LAIDLAW, 1931, *J. Fed. Mal. States*  
*Mus.* 16 : 179 (♂ ♀ Malaya); LAIDLAW, 1934, *ibid.* 17 : 550 (Mt. Kinabalu);  
KIMMINS, 1936, *ibid.* 18 : 76 (Sarawak); COOMANS DE RUITER, 1936, *De Trop.*  
*Natuur*, 25 : 71-72 (♂ ♀ W. Borneo), fig. 1 (photogr. ♂ ♀ ins.).

*Vestinus amoena* KENNEDY, 1920, *Ohio J. Sci.* 21 : 83, pl. 2, fig. 46-47 (penis);  
MAY, 1935, *Senckenbergiana*, 17 : 212, 213, 215.

Range. — Siam; Penang; Malaya.

Sumatra; Bangka; Billiton.

Karimata; Borneo; Banguay.

Habitat. — Common along the grassy borders of clear running water  
in wooded districts, up to about 1300 m in the mountains. Replaced  
in Java by *V. luctuosa*, but may either have occurred there and  
become extinct, or should still be discovered in the island.



**Vestalis beryllae LAIDLAW**

- Vestalis beryllae* LAIDLAW, 1945, Sarawak Mus. Journ. 2 : 273. — ♂ N. Borneo.  
*Vestalis beryllae* LAIDLAW, 1920, Proc. Zool. Soc. London : 326 (♂, notes); LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 550 (Mt. Kinabalu).  
 • *Vestinus beryllae* LAIDLAW, 1923, J. Mal. Br. R. Asiatic Soc. 1 : 332; MAY, 1935, Senckenbergiana, 17 : 213, fig. 8 (detail venation).

Range. — Borneo (universal).

- Habitat. — A rare species. Forest streams, up to 1000 m.

**Vestalis gracilis gracilis (RAMBUR)**

- Calopteryx gracilis* RAMBUR, 1842, Hist. nat. Ins. Névropt.: 224. — ♂♀ Bombay (India).  
*Vestalis gracilis* SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 84-86, pl. 4, fig. 1 (wing), pl. 9, fig. 6 (♂ app.); WILLIAMSON, 1904, Proc. U.S. Nat. Mus. 28 : 183-184 (Lower Siam), fig. 15 (♂ wings, Burma); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 231 (addendum; Kedah Peak); LAIDLAW, 1934, ibid. 17 : 553 (Kedah Peak).  
*Vestinus gracilis* KENNEDY, 1920, Ohio J. Sci. 21 : 83; MAY, 1935, Senckenbergiana, 17 : 207-218, figs.  
*Vestalis gracilis gracilis* FRASER, 1934, Fauna Brit. India, Odon. 2 : 126-128 (India to Siam).

Range. — Siam; Malaya.

- Habitat. — Probably similar to its congeners; found at 1000 m on Kedah Peak in Malaya.

**Vestalis luctuosa (BURMEISTER)**

- Calopteryx luctuosa* BURMEISTER, 1839, Handb. Ent. 2 : 828. — ♂♀ Java.  
*Vestalis luctuosa* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.): 24-25 (♂♀ Java; Japan: error); SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 80-82 (♂♀ Java; Japan: error), pl. 8, fig. 5 (lab.), pl. 9, fig. 5 (♂ app.); McLACHLAN, 1880, Ent. Mo. Mag. 16 : 203-204 (comp. notes); CALVERT, 1898, Trans. Amer. Ent. Soc. 25 : 49 (type); RIS, 1912, Tijdschr. Ent. 55 : 159, 177-180, pl. 8, fig. 21-25 (larval struct., Java); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 331, fig. 19 b (lab. ♀); LIEFTINCK, 1934, Treubia, 14 : 383-384 (Java, Sumatra); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 3 (S. Sumatra); MAY, 1935, Senckenbergiana, 17 : 207, 215, figs. (details venation); LIEFTINCK, 1936, De Trop. Natuur, 25, jub.-no.: 110 (W. Java), fig. 15-16 (photogr., ♂♀ ins.); LIEFTINCK, 1953, Verh. Naturf. Ges. Basel, 64 : 125, 127, 133 (Bali, notes).

Range. — Sumatra (extreme south).

Java; Bali.

- Habitat. — Similar to *amoena*. Very common in Java from near sea-level to 2000 m altitude.

**Vestalis lugens SELYS**

*Vestalis lugens* SELYS, 1879, Bull. Acad. Belg. (2) 47 : 359-360. — ♂♀ C. Sumatra.  
*Vestalis lugens* McLACHLAN, 1880, Ent. Mo. Mag. 16 : 203-204 (♂♀ Sumatra, notes); ALBARDA, 1881, in VETH, Midden Sum. Exped., Neur.: 5-6 (C. Sumatra), pl. 1, fig. 3-4 (♂♀ ins., coloured, & ♂♀ struct.); HAGEN, 1887, Abh. Zool.-bot. Ges. Wien, 37 : 648 (note); SELYS, 1889, Ann. Mus. civ. Genova, 27 : 473 (Nias & Sumatra); KRÜGER, 1898, Stett. ent. Ztg. 59 : 75 (♂♀ N. E. Sumatra); FÖRSTER in LAIDLAW, 1903, Fasc. Malayenses, Zool. 1 : 192 (♂ Jor, Perak); LAIDLAW, 1926, J. Mal. Br. R. Asiatic Soc. 4 : 228 (♂♀ Siberut & Sipora); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 231 (note); LIEFTINCK, 1931, Misc. Zool. Sum. 59 : 3 (♂ Nias, note); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 331-332 (♂♀ S. Sumatra), fig. 19 a (lab. ♀); MAY, 1935, Senckenbergiana, 17 : 213 (Sumatra), fig. 17 (♂ app.); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 3 (S. Sumatra); LIEFTINCK, 1948, Treubia, 19 : 284, 286 (♂♀ Engano).

Range. — Malaya (sporadically: Kuala Kangsar and Jor in Perak).

Nias; Siberut, Sipora (Mentawai Is.); Engano; Sumatra.

Habitat. — Most common in the lower mountain zone, but also found slightly above sea-level, and in the north Sumatra mountains found as high as 1200 m. Occurs together with *luctuosa* in the extreme south of Sumatra, *luctuosa* being the dominant species there.

**Genus NEUROBASIS SELYS**

*Neurobasis* SELYS, 1853, Bull. Acad. Belg. 20, Annexe (Syn. Calopt.): 17-18.

(Genotype: *Libellula chinensis* LINNAEUS, ♂ "China")

*Matronoides* FÖRSTER, 1897, Wiener Ent. Ztg. 16 : 103.

(Genotype: *Matrona* (*Matronoides*) *cyaneipennis* FÖRSTER, ♂ N. Borneo)

**Neurobasis chinensis chinensis (LINNAEUS)**

*Libellula chinensis* LINNAEUS, 1758, Syst. Nat. 1 : 545. — ♂ "China."

*Neurobasis chinensis* SELYS & HAGEN, 1854, Mém. Soc. Sci. Liège, 9 : 71-76 (*pars*), pl. 3, fig. 5-6 (wings), pl. 8, fig. 4 (lab.), pl. 9, fig. 4 (♂ app.); LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 86 (♂♀ Kelantan); WILLIAMSON, 1904, Proc. U.S. Nat. Mus. 28 : 187, fig. 18 (♂♀ wings, Lower Siam); NEEDHAM, 1911, Ent. News, 22 : 147-148, pl. 4, fig. 1-4 (larval struct., Himalaya); LIEFTINCK, 1931, Misc. Zool. Sum. 59 : 3 (♂♀ Nias); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 173-179 (♂♀ Malaya).

*Neurobasis chinensis chinensis* RIS, 1915, Tijdschr. Ent. 58 : 6 (♂♀ Simalur); FRASEK, 1934, Fauna Brit. India, Odon. 2 : 121-124, fig. 36; LIEFTINCK, 1940, Treubia, 17 : 340-341 (key), fig. 1 a (♂ thor., Sumatra); LIEFTINCK, 1949, Nova Guinea, new ser., 5 : 13-15, fig. 1 (♂ penis, Sumatra).

Range. — Siam; Penang; Malaya.

Simalur; Nias; Sumatra.

Habitat. — Woodland streams with grassy borders and clear running water, from near sea-level up to 1300 m.



**Neurobasis chinensis florida** HAGEN

*Neurobasis florida* HAGEN, 1854, in SELYS & HAGEN, Mém. Soc. Sci. Liège, 9 : 76. — ♀ "Malaisie" (Java restr.).

*Neurobasis chinensis*, race *florida* HAGEN, 1887, Abh. Zool.-bot. Ges. Wien, 37 : 647 (*pars*); SELYS, 1891, Ann. Mus. civ. Genova, 30 : 487 (Java, ?Timor); FÖRSTER, 1897, Ann. Soc. ent. Belg. 41 : 208-210 (Java, ?Timor); SELYS, 1897, ibid. 41 : 428 (*pars!*).

*Neurobasis chinensis florida* LIEFTINCK, 1934, Treubia, 14 : 383 (Java); LIEFTINCK, 1936, De Trop. Natuur, 25, jub.-no.: 106 (W. Java), fig. 8-9 (photogr., ♂ ins.); LIEFTINCK, 1940, Treubia, 17 : 339-341, fig. 1 b (♂ thor., Java); LIEFTINCK, 1949, Nova Guinea, new ser., 5 : 13-14, 15 (footnote); LIEFTINCK, 1950, Treubia, 20 : 664-665 (phenology).

*Neurobasis chinensis* COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 78, pl. fig. 1 (♂ ins., coloured, W. Borneo = Java).

Range. — Java (universal).

Habitat. — Occurs in localities similar to those of typical *chinensis*.

**Neurobasis chinensis longipes** HAGEN

*Neurobasis longipes* HAGEN, 1887, Abh. Zool.-bot. Ges. Wien, 37 : 648. — ♂ Mindai (Borneo).

*Neurobasis chinensis longipes* LIEFTINCK, 1940, Treubia, 17 : 338-341, fig. 1 c (♂ thor., Borneo).

*Neurobasis chinensis*, COOMANS DE RUITER, 1936, De Trop. Natuur, 25 : 72-73 (♂ ♀ W. Borneo), fig. 1 (♂ ♀ photogr.).

Range. — Borneo (universal).

Habitat. — Only known from the lowlands, but not breeding in muddy streams lacking vegetation.

**Neurobasis cyaneipennis** (FÖRSTER)

*Matrona (Matronoides) cyaneipennis* FÖRSTER, 1897, Wiener Ent. Ztg. 16 : 101-103. — ♂ Mt. Kinabalu (N. Borneo).

*Neurobasis (Matronoides) cyaneipennis* FÖRSTER, 1897, Ann. Soc. ent. Belg. 41 : 204-208, figs. (♂ ♀ N. Borneo); LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 550, 554 (Kinabalu & Batu Lawi).

*Matronoides cyaneipennis* LAIDLAW, 1912, J. Str. Br. R. Asiatic Soc. 63 : 93, 95 (♂ Borneo); LAIDLAW, 1915, Proc. Zool. Soc. London : 30 (♂ ♀ N. Borneo); KENNEDY, 1920, Ohio J. Sci. 21, pl. 2, fig. 72-73 (penis); LAIDLAW, 1920, Proc. Zool. Soc. London : 326 (♂ Sarawak & ♂ ♀ Kinabalu).

Range. — Borneo.

Habitat. — Forest streams, up to about 1350 m. Known only from Mt. Kinabalu and Mts. Selangid and Batu Lawi in Sarawak.

Family LESTIDAE

Genus LESTES LEACH

*Lestes* LEACH, 1815, in BREWSTER, Edinb. Enycl. 9 : 137.

(Genotype: *Agrion barbara* FABRICIUS, Europa) <sup>1)</sup>

*Anapetes* CHARPENTIER 1840, Lib. Europ.: 18.

(Genotype: *Agrion forcipula* CHARPERTIER 1825 = *Agrion sponsa* HANSEMANN 1823)

*Paralestes* SCHMIDT, 1951, Mém. Inst. Sci. Madagascar, ser. A, 6 : 121, 124.

(Genotype: *Lestes praemorsa* HAG.-SELYS, ♀ Manila)

*Lestes concinna* HAGEN & SELYS

*Lestes concinna* HAGEN & SELYS, 1862, Bull. Acad. Belg. (2) 13 : 321. — ♀ Manila (Philippine Is.).

*Lestes amata* HAGEN & SELYS, 1862, Bull. Acad. Belg. (2) 13 : 321-322 (♂ ♀ Batavia, W. Java).

*Lestes concinnus* LIEFTINCK, 1934, Treubia, 14 : 387-388 (♂ ♀ Java, distrib., bionomics).

*Lestes concinna* LIEFTINCK, 1953, Verh. Naturf. Ges. Basel, 64 : 127, 139-142 (synon., distrib.), fig. 1 (♂ app., Sumba).

Range. — Java; Madura; Kangean.

Habitat. — Marshes in open country, chiefly near the coast. Found upwards to about 800 m in the hills, often far away from the breeding places.

*Lestes dajakanus* LIEFTINCK

*Lestes dajakanus* LIEFTINCK, 1948, Arkiv f. Zool. 41 A : 3-6, fig. 2-3 (♂ thor. & app.) — ♂ Sarawak (N. W. Borneo).

Range. — Borneo (northwest).

Habitat. — Only known from a single specimen, without further indication of habitat.

*Lestes praezellens* LIEFTINCK

*Lestes praezellens* LIEFTINCK, 1937, Treubia, 16 : 59-62, fig. 2-3 (♂ ♀ thor., ♂ app.) — ♂ ♀ S. W. Java.

*Lestes praezellens* LIEFTINCK, 1939, Treubia, 17 : 50 (S. W. Java, note).

Range. — Java (southwest).

Habitat. — Forest marshes and weedy ponds in coastal areas.

<sup>1)</sup> Designated by HAGEN, 1848, *Stett. ent. Ztg.* 9 : 147 (*teste* SCHMIDT 1951).



[*Lestes praemorsa praemorsa* SELYS

*Lestes praemorsa* HAGEN & SELYS, 1862, Bull. Acad. Belg. (2) 13 : 320-321. — ♀  
Manila (Philippine Is.).

Range. — Extra-limital.]

• *Lestes praemorsa decipiens* KIRBY

*Lestes decipiens* KIRBY, 1893, J. Linn. Soc. London, Zool. 24 : 565-566. — ♂ ♀ Ceylon.

• *Lestes praemorsa* LAIDLAW, 1902, Proc. Zool. Soc. London, 2 : 382 (♂ ♀ Malaya);  
LAIDLAW, 1931, Bull. Raffles Mus. 5 : 91 (♀ Mangalum I.); LIEFTINCK, 1937,  
Treubia, 16 : 62-63 (notes, distrib.).

*Lestes praemorsus* RIS, 1927, Zool. Meded. 10 : 11 (♂ ♀ Sumātra); SCHMIDT, 1934,  
Arch. Hydrob. Suppl. 13 : 333-334 (*pars*), fig. 21-27 (♂ thor. & app., Sumatra);  
LIEFTINCK, 1939, Treubia, 17 : 50 (S. W. Java).

*Lestes praemorsus praemorsus* LIEFTINCK, 1934, Treubia, 14 : 388-389 (Java,  
bionomics).

• *Lestes praemorsus decipiens* LIEFTINCK, 1949, Nova Guinea, new ser., 5 : 33-37  
(key, notes, distrib.); LIEFTINCK, 1953, Idea, 9 : 53 (Panaitan).

Range. — Siam; Malaya.

Sumatra; Billiton.

Panaitan; P. Deli (off southwest Java); Java; Kangean.

Borneo; Mangalum.

Habitat. — Weedy ponds, marshes, abandoned paddy fields, etc.,  
chiefly in low country.

• *Lestes praeivius* LIEFTINCK

*Lestes praeivius* LIEFTINCK, 1940, Treubia, 17 : 344-347, fig. 3 (♂ app.)<sup>o</sup> — ♂ ♀ E.  
Borneo (*terr. typ.*); ♂ ♀ Engano.

Range. — Engano.

Borneo (east).

Habitat. — Lowland marshes in forested areas.

Genus *OROLESTES* MCLACHLAN

*Orolestes* MCLACHLAN, 1895, Ann. Mag. Nat. Hist. (6) 16 : 21-23.

(Genotype: *Orolestes selysi* MCLACHLAN, Assam)

• *Orolestes wallacei* (KIRBY)

• *Lestes wallacei* KIRBY, 1889, Proc. Zool. Soc. London : 302-303. — ♀ Sarawak (N. W.  
Borneo).

• *Orolestes ndeana* KRÜGER, 1898, Stett. ent. Ztg. 59 : 127-130 (♂ N. E. Sumatra);  
RIS, 1927, Zool. Meded. 10 : 11-15 (♂ ♀ C. Sumatra), fig. 4-6 (♂ app., ♀ wings  
& genit.).

*Lestes ridleyi* LAIDLAW, 1902, Proc. Zool. Soc. London, 1 : 92 (♂ Malaya).

*Lestes* spec. LAIDLAW, 1920, Proc. Zool. Soc. London : 341 (♂ Borneo); LAIDLAW, 1920, Rec. Ind. Mus. 19 : 149, fig. 1 (♂ wings, Borneo).

*Orolestes wallacei* LAIDLAW, 1928, Proc. Zool. Soc. London : 134-135, 138 (♂ Malaya & Borneo); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 184 (♀), 246 (♂) (♀ Pahang, Malaya; ♂ N. Borneo); FRASER, 1933, Rec. Ind. Mus. 35 : 176, 177-178 (Sumatra, not seen; Borneo, as *O. wallacei* + *udeana*), fig. 1 D & 2 (♂ penis & app.), pl. 4, fig. 1 (♂ wings, ? Borneo); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 5-6 (Perak, Malaya, & S. Sumatra); LIEFTINCK, 1939, Treubia, 17 : 45-61, fig. 1-5 (in: ovip., egg, larva, larval struct.: Malaya, Sumatra, Billiton, Java, Borneo).

Range. — Malaya.

Sumátra; Billiton.

Java (southwest).

Borneo.

Habitat. — Forest marshes and slow-flowing ponded streams in low country.

### Genus **PLATYLESTES** SELYS

*Platylestes* SELYS, 1862, Bull. Acad. Belg. (2) 13 : 337-338.

(Genotype: *Lestes platystyla* RAMBUR, ♀ Ind. or.)

#### **Platylestes heterostylus** LIEFTINCK

*Platylestes heterostylus* LIEFTINCK, 1932, Stylops, 1 : 248-251, fig. 1-2 (♂ thor. & app.) — ♂ S. Java.

*Platylestes heterostylus* LIEFTINCK, 1934, Treubia, 14 : 389 (Java, note).

Range. — Malaya (Pahang).

Billiton.

Java (west, southwest and south).

Borneo (southeast).

Habitat. — Forest marshes, chiefly in low country.<sup>1)</sup>

### Family **MEGAPODAGRIIDAE**

#### Genus **BORNARGIOLESTES** KIMMINS

*Bornargiolestes* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 86-87.

(Genotype: *Bornargiolestes nigra* KIMMINS, ♂ Borneo)

#### **Bornargiolestes nigra** KIMMINS

*Bornargiolestes nigra* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 86-87, fig. 9

A-D (penis, app.) — ♂ Sarawak (N. W. Borneo).

<sup>1)</sup> Mr. F. C. DRESCHER once took a ♀ in his house at Bandung (750 m), evidently a wind-borne specimen.



Range. — Borneo (northwest).

Habitat. — Only known from Mt. Dilit, 1000 m.

Genus **PODOLESTES** SELYS

*Podolestes* SELYS, 1862, Bull. Acad. Belg. (2) 14 : 41.  
(Genotype: *Podolestes orientalis* SELYS, ♀ "Malaisie")

**Podolestes atomarius** LIEFTINCK

*Podolestes atomarius* LIEFTINCK, 1950, Zool. Meded. 31 : 40-44, fig. 1-2 (♂ ♀ thor.,  
♂ app.) — ♂ ♀ S. E. Borneo.

Range. — Borneo (southeast and south).

Habitat. — Swampy lowland forest. Breeds in rain puddles and shallow marshes; larva among root-masses and decaying vegetable matter.

**Podolestes buwaldai** LIEFTINCK

*Podolestes buwaldai* LIEFTINCK, 1940, Treubia, 17 : 347-348, fig. 4 b (♂ thor.) — ♂  
E. Sumatra.

*Podolestes buwaldai* LIEFTINCK, 1950, Zool. Meded. 31 : 40 (key).

Range. — Sumatra (east).

Habitat. — Only known from the type locality: lowlands of Inderagiri.

**Podolestes chrysopus** SELYS

*Podolestes chrysopus* SELYS, 1889, Ann. Mus. civ. Genova, 27 : 480. — ♂ ♀ N. & W.  
Borneo.

*Podolestes orientalis* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 89-90 (♂ Borneo).

*Podolestes chrysopus* LIEFTINCK, 1935, Treubia, 15 : 181-183, fig. 3 (♂ app.);  
KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 86 (♂ ♀ W. Borneo); LIEFTINCK,  
1950, Zool. Meded. 31 : 40 (key).

Range. — Borneo (north and west).

Habitat. — At muddy forest brooks and in marshes with slowly running water; low country.

**Podolestes coomansi** LIEFTINCK

*Podolestes coomansi* LIEFTINCK, 1940, Treubia, 17 : 348-350, fig. 4 c & 5 (♂ thor.  
& app.) — ♂ ♀ S. E. Sumatra.

*Podolestes coomansi* LIEFTINCK, 1950, Zool. Meded. 31 : 40 (key).

Range. — Sumatra (east).

Habitat. — Marshy spot in second growth forest near Palembang.

**Podolestes furcifer** LIEFTINCK

*Podolestes furcifer* LIEFTINCK, 1950, Zool. Meded. 31 : 40 (key), 44-47, fig. 3-4 (♂ thor. & app.) — ♂ S. Borneo.

Range. — Borneo (south).

Habitat. — Known only from the forest swamps around Sampit, where it is locally common. Keeps low to the ground and rests with wings outspread. A very inconspicuous insect.

**Podolestes harrissoni** LIEFTINCK

*Podolestes harrissoni* LIEFTINCK, 1953, Treubia, 22 : 233-236, fig. 1-2 (♂ wings, app. & ♀ apex abd.) — ♂ ♀ Sarawak (N. W. Borneo).

*Podolestes chrysopus* LAIDLAW, 1920, Proc. Zool. Soc. London : 332; LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 302, pl. 3, fig. 2 (♂ wings); HINCKS, 1930, Sarawak Mus. Journ. 4 : 52; RIS, 1927, Zool. Meded. 10 : 16 (note).

Range. — Borneo (Sarawak).

Habitat. — Marshes and slow flowing brooks in virgin and second growth forest; low country.

**Podolestes orientalis** SELYS

*Podolestes orientalis* SELYS, 1862, Bull. Acad. Belg. (2) 14 : 42. — ♀ Malacca (*err. pro* "Malaisie").

*Podolestes orientalis* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 89-90 (♀ juv. Borneo); SELYS, 1889, Ann. Mus. civ. Genova, 27 : 479 (♂ ♀ Kiour, *recte* Riouw Arch.); KRÜGER, 1898, Stett. ent. Ztg. 59 : 98-99 (♂ ♀ N. E. Sumatra); KENNEDY, 1920, Ohio J. Sci. 21, pl. 3, fig. 111-112 (penis, Borneo); RIS, 1927, Zool. Meded. 10 : 15-16, fig. 7 (wings, Sumatra); LAIDLAW, 1931, J. Fed. Mal. States Mus. 15 : 184 (♀ Pahang); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 6 (♂ S. Sumatra); LIEFTINCK, 1935, Treubia, 15 : 177-181, fig. 1-2 (♂ thor., Sumatra, Billiton, Borneo; ♂ app., Sumatra); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 86 (♂ ♀ N. W. Borneo); LIEFTINCK, 1940, Treubia, 17 : 349, fig. 4 d (♀ thor., Borneo); LIEFTINCK, 1950, Zool. Meded. 31 : 41 (key).

Range. — Malaya.

Sumatra; Riouw Arch.; Lingga Arch.; Billiton.  
Borneo.

Habitat. — Lowland forest. Along muddy brooks in shady surroundings.

**Genus RHINAGRION** CALVERT

*Rhinagrion* CALVERT, 1913, Proc. Acad. Nat. Sci. Philad. 65 : 258.

(Genotype: *Amphilestes macrocephala* SELYS, ♂ ♀ Malaya)

**Rhinagrion borneense** (SELYS)

*Amphilestes macrocephala* race? *borneensis* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 93. — ♂ Labuan (N. Borneo).



*Rhinagrion borneense* LAIDLAW, 1920, Proc. Zool. Soc. London : 332-333, (♂♀ Sarawak); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 302 (key), pl. 3, fig. 3 (wings); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 86 (♂ Sarawak).

*Rhinagrion macrocephala* KENNEDY, 1920, Ohio J. Sci. 21, pl. 3, fig. 121-122 (penis, "Labauan": recte Labuan = ? *borneense*).

Range. — Borneo (probably universal).

Habitat. — Sluggish forest brooks in low country. Rests on foliage in sunlit openings, often high above the water's surface. Wings are held in horizontal position. Larva concealed among decaying vegetable matter, in pools under the bank of a stream.

#### *Rhinagrion elopuræ* (MCLACHLAN)

*Amphilestes elopuræ* MCLACHLAN in SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 221-222. — ♂ N. Borneo.

*Rhinagrion elopuræ* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 303 (key).

Range. — Borneo (north).

Habitat. — Only known from the type locality.

#### *Rhinagrion macrocephalum* (SELYS)

*Amphilestes macrocephala* SELYS, 1862, Bull. Acad. Belg. (2) 14 : 43-44. — ♂♀ Mt. Ophir (Malaya).

*Amphilestes macrocephala* KRÜGER, 1898, Stett. ent. Ztg. 59 : 100 (♂ N. E. Sumatra).

*Rhinagrion macrocephalum* MUNZ, 1919, Mem. Amer. Ent. Soc. 3, pl. 9, fig. 55 (wings, loc.?).

*Rhinagrion macrocephala* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 362 (key).

Range. — Malaya.

Sumatra (north and northeast).

Habitat. — Lowland streams with swiftly flowing water.

#### *Rhinagrion mima* (KARSCH)

*Amphilestes mima* KARSCH, 1891, Entom. Nachr. 17 : 242. — ♂ N. E. Sumatra.

*Amphilestes mima* KRÜGER, 1898, Stett. ent. Ztg. 59 : 100-101 (♂ N. E. Sumatra); LAIDLAW, 1902, Proc. Zool. Soc. London, 2 : 382-383 (♂♀ Kelantan, Malaya).

*Rhinagrion mima* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 302 (key); LIEFTINCK, 1934, Treubia, 14 : 389 (Malaya, note on habits).

*Rhinagrion viridata*<sup>1)</sup> FRASER, Proc. R. Ent. Soc. London (B) 7 : 198 (♂ Siam-Burma frontier).

<sup>1)</sup> A male from Jor (Perak), and others among a series of freshly captured specimens (all males) from northeast Sumatra (Kuala Simpang), correspond closely with the colour-notes of *viridata* as given in the description. Since *mima* varies a great deal in body-size as well as in the number of postnodal cross-veins, the differences observed between *mima* and *viridata* seem to fall within the limits of individual variation of the former. For these reasons both species are considered synonymous.

Range. — Siam; Malaya.  
Sumatra (northeast).

Habitat. — Forest streams in lowland and hill country. Like *tricolor*, males rest with outspread wings on dead branches of trees in the stream bed.

### **Rhinagrion tricolor (KRÜGER)**

*Amphilestes tricolor* KRÜGER, 1898, Stett. ent. Ztg. 59 : 136-138. — ♂ Java.

*Rhinagrion tricolor* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 303 (key); LIEFTINCK, 1934, Treubia, 14 : 389 (Java, notes).

Range. — Java.

Habitat. — Deeply recessed streams in dense primeval forest, 100-300 m above sea-level. Males rest on branches of trees fallen into the water. Oviposits in moss-covered logs and boulders in mid-stream.

## Family PLATYSTICTIDAE

### Genus PROTOSTICTA SELYS

*Protosticta* SELYS, 1885, C. R. Soc. Ent. Belg. (3) 66 (Ann. Soc. Ent. Belg. 29) : CXLV.  
(Genotype: *Protosticta simplicinervis* SELYS, ♂ — not ♀ — Celebes)

### **Protosticta feronia LIEFTINCK**

*Protosticta feronia* LIEFTINCK, 1933, Konowia, 11 : 281-285 (incl. key), fig. 1 (♂ app.) — ♂ ♀ W. Borneo.

Range. — Borneo (northwest and west).

### **Protosticta foersteri LAIDLAW**

*Protosticta foersteri* LAIDLAW, 1902, Proc. Zool. Soc. London, 2 : 383-384. — ♀ Perak (Malaya).

*Protosticta foersteri* FÖRSTER in LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 8-10 (♂ Perak), fig. 2 A-B (♂ app.); LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 306 (note); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 190 (♂ ♀ notes).

Range. — Malaya (Perak).

### **Protosticta kinabaluensis LAIDLAW**

*Protosticta kinabaluensis* LAIDLAW, 1915, Proc. Zool. Soc. London : 37-38, fig. 5 B (♂ app.) — ♂ Mt. Kinabalu (N. Borneo).

*Protosticta kinabaluensis* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 306 (note); LIEFTINCK, 1933, Konowia, 11 : 285 (key); LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 551 (Mt. Kinabalu).



Range. — Borneo (north).

Habitat. — Known only from the type locality; caught at 1000 m.

### **Protosticta versicolor LAIDLAW**

*Protosticta versicolor* LAIDLAW, 1913, Proc. Zool. Soc. London : 78-79. — ♀ N. E. Borneo.

*Protosticta versicolor* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 307 (note); LIEFTINCK, 1933, Konowia, 11 : 285 (key); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 103 (♀ Sarawak, note).

Range. — Borneo (Sarawak).

Remarks. — Two records are known, but only for the female.

### Genus **DREPANOSTICTA LAIDLAW**

*Drepanosticta* LAIDLAW, 1917, Rec. Ind. Mus. 13 : 339, 341.

(Genotype: *Protosticta carmichaeli* LAIDLAW, ♂ Sikkim)

### **Drepanosticta actaeon LAIDLAW**

*Drepanosticta actaeon* LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 558-559, fig. 3 (♂ app.) — ♂ Mt. Kinabalu (N. Borneo).

Range. — Borneo (north).

- Habitat. — Known only from the type locality, at 200 m.

### **Drepanosticta arcuata LIEFTINCK**

*Drepanosticta arcuata* LIEFTINCK, 1934, Treubia, 14 : 469-470, 471 (key), pl. 10, fig. 1, 2, 4 (♂ proth., pterost., app.) — ♂ ♀ S. Sumatra.

*Platysticta sundana* KRÜGER, 1898, Stett. ent. Ztg. 59 : 107-111 (pars, ♀ Sumatra).  
*Drepanosticta kruegeri* RIS, 1927, Zool. Meded. 10 : 19-20, 45, fig. 10 (♂ app., Sumatra).

*Drepanosticta kruegeri* SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 334 (♂ Sumatra).

*Drepanosticta arcuata* LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 6 (Sumatra).

Range. — Sumatra.

Habitat. — Probably widely distributed. Occurs from near sea-level up to 600 m at small brooks and seepages in dense forest.

### **Drepanosticta attala LIEFTINCK**

*Drepanosticta attala* LIEFTINCK, 1934, Treubia, 14 : 472-474, fig. 2, 3 (♂ ♀ proth., ♂ app.) — ♂ ♀ W. Borneo.

Range. — Borneo (west).

Habitat. — Forest brooks in low hilly country.

**Drepanosticta barbatula** LIEFTINCK

*Drepanosticta barbatula* LIEFTINCK, 1940, *Treubia*, 17 : 351-353, fig. 6 (♂ app.) —  
♂ E. Borneo.

Range. — Borneo (east).

Habitat. — Known only from near Sangkulirang.

**Drepanosticta bartelsi** LIEFTINCK

*Drepanosticta bartelsi* LIEFTINCK, 1937, *Treubia*, 16 : 71-72, fig. 8 (♂ app.) — ♂ ♀  
S. W. Java.

Range. — Java (southwest).

Habitat. — Steepages in dark ravines of the coastal forest.

**Drepanosticta bispina** FRASER

*Drepanosticta bispina* FRASER, 1932, *Mém. Mus. R. Hist. nat. Belg. (hors série)*, 4 :  
5-6, fig. 1 (♀ proth.) — ♀ C. W. Sumatra.

Range. — Sumatra (central west).

Habitat. — Described from a single female collected near Pajakumbuh.

**Drepanosticta crenitis** LIEFTINCK

*Drepanosticta crenitis* LIEFTINCK, 1933, *Konowia* 11 : 288-292, 296 (key), fig. 3 (♂  
app.) — ♂ ♀ W. Borneo.

Range. — Borneo (west).

Habitat. — Forest brook on Mt. Poteng, 325 m.

**Drepanosticta dentifera** KIMMINS

*Drepanosticta dentifera* KIMMINS, 1936, *J. Fed. Mal. States Mus.* 18 : 101-103, fig.  
17 (♂ app.) — ♂ Sarawak (N. W. Borneo).

Range. — Borneo (northwest).

Habitat. — Mt. Dulit. At waterfall in primitive forest, about 1100 m.

**Drepanosticta drusilla** LIEFTINCK

*Drepanosticta drusilla* LIEFTINCK, 1934, *Treubia*, 14 : 474-476, fig. 4-5 (♂ ♀ proth.,  
♂ app.) — ♂ ♀ W. Borneo.

Range. — Borneo (west).

Habitat. — Forest brooks in hill-country at low elevation.

**Drepanosticta dulitensis** KIMMINS

*Drepanosticta dulitensis* KIMMINS, 1936, *J. Fed. Mal. States Mus.* 18 : 98-100, fig. 15  
A-D (♂ ♀ app.) — ♂ ♀ Sarawak (N. W. Borneo).

Range. — Borneo (northwest).

Habitat. — Mt. Dulit. At waterfall, and flying over rocks and boulders on small stream, 1000-1300 m.



**Drepanosticta dupophila** LIEFTINCK

*Drepanosticta dupophila* LIEFTINCK, 1933, Konowia, 11 : 286-288, 296 (key), fig. 2 (♂ app.) — ♂ W. Bornco.

Range. — Borneo (west).

• Habitat. — Small forest streams in low country.

**Drepanosticta fontinalis** LIEFTINCK

*Drepanosticta fontinalis* LIEFTINCK, 1937, Treubia, 16 : 64-67, fig. 5 b & 6 (♂ pterost. & app.) — ♂ Kelantan (Malaya).

*Drepanosticta fontinalis* race *wheeleri* FRASER, 1942, Proc. R. Ent. Soc. London (B) 11 : 96 (composite descr.: ♂ Wellesley, ♂ Penang ? var.).

Range. — Malaya.

Remarks. — Only known from the type locality.

**Drepanosticta forficula** KIMMINS

*Drepanosticta forficula* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 100-101, fig. 16 A-D (♂ ♀ app.) — ♂ ♀ Sarawak (N. W. Borneo).

Range. — Borneo (northwest).

Habitat. — Moss forest on Mt. Dulit, about 1300 m.

**Drepanosticta gazella** LIEFTINCK

*Drepanosticta gazella* LIEFTINCK, 1929, Tijdschr. Ent. 72 : 110-112, 115 (key), fig. 1-3 (♂ proth., app. & apex wing). — ♂ ♀ Central Java.

*Drepanosticta gazella* LIEFTINCK, 1934, Treubia, 14 : 389-390 (Java, notes); LIEFTINCK, 1937, ibid. 16 : 72 (comp. descr. & notes).

Range. — Java (west and central).

Habitat. — Tiny brooks and seepages in jungly retreats, from 100 to 1500 m, as far east as Mt. Telomojo in central Java.

**Drepanosticta hamadryas** LAIDLAW

*Drepanosticta hamadryas* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 187, fig. 2 (♂ app.) — ♂ Pahang (Malaya).

Range. — Malaya.

Habitat. — Only known from Kuala Tahan, low country.

**Drepanosticta krugeri** LAIDLAW

*Drepanosticta krugeri* LAIDLAW, 1926, J. Mal. Br. R. Asiatic Soc. 4 : 228-229, fig. 2 a-c (♂ app., pterost. & proth.) — ♂ ♀ Mentawai Is.

*Drepanosticta kruegeri* LIEFTINCK, 1934, Treubia, 14 : 468-469, 471 (key), pl. 10, fig. 1-4 (♂ app., penis, pterost. & thor., Pagai I.); LIEFTINCK, 1948, ibid. 19 : 284 (Mentawai Is.).

Range. — Siberut, Sipora and N. Pagai (Mentawai Is.)

**Drepanosticta pan LAIDLAW**

*Drepanosticta pan* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 185-187, fig. 1 (♂ app.) — ♂ ♀ Perak (Malaya).

*Drepanosticta spec.* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 305-306, pl. 5, fig. 8 (♂ app.; ♂ ♀ Malaya).

Range. — Malaya.

Habitat. — Known only from Batang Padang in Perak, 600 m.

**Drepanosticta pytho LIEFTINCK**

*Drepanosticta pytho* LIEFTINCK, 1937, Treubia, 16 : 68-70, fig. 7 (♂ app.) — ♂ W. Sumatra.

Range. — Sumatra (west).

Habitat. — Only known from near Padang.

**Drepanosticta quadrata (SELYS)**

*Platysticta quadrata* SELYS, 1860, Bull. Acad. Belg. (2) 10 : 441. — ♂ Singapore (Malaya).

*Platysticta quadrata* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 304-306; LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 188-189 (note).

Range. — Malaya.

Remarks. — Known only with certainty from the type locality.

**Drepanosticta rufostigma (SELYS)**

*Platysticta rufostigma* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 155-156. — ♂ Labuan (N. Borneo).

*Platysticta rufostigma* LAIDLAW, 1913, Proc. Zool. Soc. London : 79, pl. 4, fig. 9 (♂ app., Borneo).

*Drepanosticta rufostigma* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 306 (notes); LIEFTINCK, 1933, Konowia, 11 : 292-296 (♂ ♀ W. Borneo, descr., key), fig. 4 (♂ app.); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 98 (♂ ♀ Sarawak).

Range. — Borneo (west and north).

Habitat. — Forest brooks, from near sea-level up to about 500 m.

**Drepanosticta sharpi (LAIDLAW)**

*Platysticta sharpi* LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 10-11. — ♂ ♀ Perak (Malaya).

*Platysticta quadrata* FÖRSTER, in LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 10 (♂ Kelantan).

*Drepanosticta sharpi* LAIDLAW, 1924, J. Mal. Br. R. Asiatic Soc. 2 : 304-305, pl. 5, fig. 7 (♂ app., *sharpei*, Perak); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 189 (♂ Pahang); LIEFTINCK, 1937, Treubia, 16 : 63-64, fig. 4 & 5 a (♂ app., pterost., Kelantan).



Range. — Malaya.

Habitat. — Reported from Bukit Besar (Nawngchik) at about 800 m, but occurs also at lower altitudes in Kelantan, Pahang and Perak.

### *Drepanosticta siebersi* FRASER

*Drepanosticta siebersi* FRASER, 1926, Treubia, 8 : 490-491, fig. 6 a (♂ proth.) — ♂ ♀ E. Java.

*Drepanosticta siebersi* LIEFTINCK, 1929, Tijdschr. Ent. 57 : 114-115 (key); LIEFTINCK, 1934, Treubia, 14 : 390 (notes).

Range. — Java (east).

Habitat. — Only known from the Tengger mountains, 1700 m.

### *Drepanosticta silenus* LAIDLAW

*Drepanosticta silenus* LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 557-558, fig. 2 (♂ app.) — ♂ ♀ Perak (Malaya).

Range. — Malaya.

Habitat. — Known only from the Larut Hills in Perak, about 1500 m.

### *Drepanosticta spatulifera* <sup>1)</sup> LIEFTINCK

*Drepanosticta spatulifera* LIEFTINCK, 1929, Tijdschr. Ent. 57 : 112-113, 114 (key), fig. 4-6 (♂ proth., app. & apex wing). — ♂ ♀ Central Java.

*Drepanosticta ? spatulifera* SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 334, fig. 28 (♀ proth., E. Java); *D. s.* LIEFTINCK, 1934, Treubia, 14 : 390 (Java, notes).

Range. — Java (central).

Habitat. — Southern slopes of Mt. Slamet, 700-800 m.

### *Drepanosticta sundana* (KRÜGER)

*Platysticta sundana* KRÜGER, 1898, Stett. ent. Ztg. 59 : 107-111 (*pars*). — ♂ Java.

*Platysticta sundana* RIS, 1912, Tijdschr. Ent. 55 : 160, pl. 7, fig. 2 (♂ app., S. Java).

*Drepanosticta sundana* LIEFTINCK, 1929, Tijdschr. Ent. 72 : 114 (key), fig. 4-8 (♂ proth. & app., S. Java); LIEFTINCK, 1934, Treubia, 14 : 390 (Java, notes); LIEFTINCK, 1934, *ibid.* : 464-468 (♂ ♀, Java), tfig. 1 (larva), pl. 9, fig. 1-6 (larval structures), 470-471 (key), pl. 10, fig. 1-2 (♂ app., pterost.).

Range. — Java (universal).

Habitat. — Runnels and streams in shady surroundings, also in second growth forest, from sea-level up to 960 m.

<sup>1)</sup> The incorrect spelling of this name in the original description may, it is hoped, justify its emendation.

**Drepanosticta tenella** LIEFTINCK

*Drepanosticta tenella* LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 7, fig. 1 (♂ app.)  
— ♂ ♀ S. Sumatra.

Range. — Sumatra (south and west).

Habitat. — Small streams in primitive forest, 300-600 m.

Family **PROTONEURIDAE**Genus **ELATTONEURA** COWLEY

*Elattoneura* COWLEY, 1935, Ent. Mo. Mag. 71 : 14; COWLEY, 1936,  
Ann. Mag. Nat. Hist. (10) 17 : 511, 517-518.

(Genotype: *Disparoneura glauca* SELYS, ♂ ♀ S. Africa)

**Elattoneura analis** (SELYS)

*Alloneura analis* SELYS, 1860, Bull. Acad. Belg. (2) 10 : 451-452. — ♂ ♀ Mt. Ophir  
(Malaya).

*Disparoneura analis* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 169 (Malaya).

*Elattoneura analis* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 518, 523; LIEFTINCK, 1937, Treubia, 16 : 74-75 (ref. & descr. ♂), 78 (key ♂), 79 (note ♀), fig. 10 a & 11 a (♂ thor. & app., W. Borneo).

Range. — Malaya.

Sumatra (northeast).

Borneo (universal).

Habitat. — Streams and rivulets in the lowlands. In the extensive forest swamps of south Borneo moderately common over sluggish shaded brooks lacking aquatic vegetation. Larva among rootlets of overhanging trees and *Pandanus*.

**Elattoneura aurantiaca** (SELYS)

*Disparoneura aurantiaca* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 169-170. —  
♂ ♀ Sarawak (N. W. Borneo).

*Disparoneura aurantiaca* LAIDLAW, 1913, Proc. Zool. Soc. London : 76 (note).

*Elattoneura aurantiaca* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 518, 523;  
LIEFTINCK, 1937, Treubia, 16 : 80-82, fig. 14 (♂ app., ♀ proth; W. Borneo).

Range. — Malaya (Pahang).

Sumatra (south); Bangka; Billiton.

Borneo (universal).

Habitat. — Found in similar situations to *analis*; but breeds probably also in trickles and forest pools.



**Elattoneura coomansi** LIEFTINCK

*Elattoneura coomansi* LIEFTINCK, 1937, Treubia, 16 : 79-80, fig. 13 (♂ app. & ♀ proth.) — ♂ ♀ W. Borneo (*terr. typ.*); ♂ Bangka; ♂ ♀ Billiton.

Range. — Bangka; Billiton.  
Borneo (west).

**Elattoneura erythromma** LIEFTINCK

*Elattoneura erythromma* LIEFTINCK, 1953, Treubia, 22 : 383-385, fig. 1 (♂ app., ♀ proth. & apex abd.) — ♂ ♀ S. Borneo.

Range. — Borneo (south).

Habitat. — Known only from the type locality. Caught over small rivulets with slow-flowing water in dense lowland forest.

**Elattoneura longispina** LIEFTINCK

*Elattoneura longispina* LIEFTINCK, 1937, Treubia, 16 : 76-79, fig. 10 b-c, 11 b & 12 (♂ ♀ thor., ♂ app., ♀ proth. & genit.) — ♂ ♀ W. Borneo (*terr. typ.*); ♂ ♀ Billiton.

Range. — Billiton.  
Borneo (west and southeast).

Genus **PRODASINEURA** COWLEY

*Prodasineura* COWLEY, 1934, Entomologist, 67 : 202, 203; COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 512, 519-521.  
(Genotype: *Alloneura dorsalis* SELYS, ♂ Borneo)

**Prodasineura abbreviata** LIEFTINCK

*Prodasineura abbreviata* LIEFTINCK, 1951, Idea, 8 : 76-80, 83 (key), fig. 1, 2, 5, 6, 9, 11-13 (♂ ♀ head, thor., pterost., app., proth.) — ♂ ♀ S. E. Borneo.

Range. — Borneo (southeast).

**Prodasineura autumnalis** (FRASER)

*Caconeura autumnalis* FRASER, 1922, Mem. Dept. Agric. India, 7 : 43. — ♂ Assam.  
*Caconeura corvina* LIEFTINCK, 1930, Treubia, 12 : 138-141, 151 (key), fig. 1-4 (♂ ♀ thor., wing, app., ♀ proth., Java); SCHMÆDT, 1934, Arch. Hydrob. Suppl. 13 : 336 (Java).  
*Caconeura autumnalis* FRASER, 1933, Fauna Brit. India, Odon. 1 : 225 (Java); LIEFTINCK, 1934, Treubia, 14 : 390-391 (Java & Karimondjawa, bionomics).  
*Prodasineura autumnalis* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 520, 523; LIEFTINCK, 1953, Treubia, 21 : 669-672, fig. 27-31 (larva & larval struct., W. Java).

Range. — Sumatra (west).

Java (universal); Karimondjawa Is.

Habitat. — Woodland rivers and small brooks, from sea-level up to 600 m. Breeds also in shady mud-bottomed streams in secondary forest.

### *Prodasineura collaris* (SELYS)

*Alloneura collaris* SELYS, 1860, Bull. Acad. Belg. (2) 10 : 455-456. — ♂♀ Malaya (terr. typ.); ♂ Borneo.

\* *Disparoneura collaris* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 176 (add. descr.); LAIDLAW, 1902, Proc. Zool. Soc. London, 2 : 384 (♂ Malaya).

*Alloneura dohrni*<sup>1)</sup> KRÜGER, 1898, Stett. ent. Ztg. 59 : 114-118 (♂♀ N. E. Sumatra).

*Disparoneura notostigma collaris* FÖRSTER in LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odop. 2 : 13-14 (Perak, notes).

\* *Disparoneura dohrni* RIS, 1915, Tijdschr. Ent. 58 : 9, fig. 4 (♀ proth.; ♂♀ Simalur); RIS, 1927, Zool. Meded. 10 : 21 (♂♀ Sumatra).

*Caconeura collaris dohrni* LAIDLAW, 1926, J. Mal. Br. R. Asiatic Soc. 4 : 230 (♂ Mentawai Is.); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 8 (♂♀ Sumatra, descr. notes).

\* *Caconeura collaris* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 192 (Mentawai Is., notes).

*Prodasineura collaris & dohrni* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 520, 524; P.c.d. LIEFTINCK, 1948, Treubia, 19 : 284 (Sumatra, Simalur, Mentawai Is.).

Range. — Siam; Malaya.

Simalur; Siberut & Sipora (Mentawai Is.); Sumatra (universal); Billiton (and Pulau Mindanau).

Borneo (universal).

Habitat. — Lowland forest, 100-600 m. Occurs also in Lower Burma (*botti* FRAS.).

### *Prodasineura delicatula* (LIEFTINCK)

*Caconeura delicatula* LIEFTINCK, 1930, Treubia, 12 : 141-143, 151 (key), fig. 5-8 (♂♀ thor., wing, app., ♀ proth.) — ♂♀ S. Java.

*Caconeura delicatula* LIEFTINCK, 1934, Treubia, 14 : 391 (Java, notes).

*Prodasineura delicatula* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 520, 524; LIEFTINCK, 1948, Treubia, 19 : 223, 230-231 (key), fig. 1-2 (♂ thor. & app., ♀ proth., Java); LIEFTINCK, 1950, *ibid.* 20 : 664-665 (phenology); LIEFTINCK, 1953, *Idea*, 9 : 53 (Panaitan).

\* *Caconeura dorsalis delicatula* FRASER, 1946, Ent. Mo. Mag. 82 : 201-202 (notes).

<sup>1)</sup> It seems likely that the name *dohrni* will eventually have to be used to cover the Sumatran populations of *collaris*, which differ very slightly in the structure of the posterior lobe of the ♀ prothorax and in the absence of a rudiment of the anal bridge-vein; this last feature, however, is not a constant character.



Range. — Panaitan; Java (west and central south).

Habitat. — Rocky streams and rivulets in forested areas, from near sea-level up to about 500 m.

### *Prodasineura dorsalis* (SELYS)

- *Alloneura dorsalis* SELYS, 1860, Bull. Acad. Belg. (2) 10 : 456. — ♂ Sarawak (N. W. Borneo).

*Alloneura dorsalis* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 178 (♂ ♀ Sarawak).

- *Disparoneura dorsalis* LAIDLAW, 1913, Proc. Zool. Soc. London : 75 (key); MUNZ, 1919, Mem. Amer. Ent. Soc. 3, pl. 19, fig. 143 (wing).

*Caconeura dorsalis* KENNEDY, 1917, Ent. News, 28, pl. 21, fig. 13-14 (penis).

*Prodasineura dorsalis* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 520, 524, fig. 5 (wings); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 93 (♂ N. Borneo); LIEFTINCK, 1948, Treubia, 19 : 224-226, 229-230 (key), fig. 1-3 (♂ thor., ♀ proth., ♂ app.).

*Caconeura dorsalis dorsalis* FRASER, 1946, Ent. Mo. Mag. 82 : 201-202 (notes).

Range. — Borneo (west and northwest).

Habitat. — Small streams in virgin forest at low elevation above the sea.

### *Prodasineura flammula* LIEFTINCK

*Prodasineura flammula* LIEFTINCK, 1948, Treubia, 19 : 227-229, 230 (key), fig. 1 & 3 (♂ thor. & app.) — ♂ E. Borneo.

Range. — Borneo (east and southeast).

Habitat. — Rivulets and brooks in swampy forest of the lowlands.

### *Prodasineura haematosoma* LIEFTINCK

*Prodasineura haematosoma* LIEFTINCK, 1937, Treubia, 16 : 84-86, fig. 16 (♂ app.) — ♂ ♀ W. Borneo.

Range. — Borneo (west).

Habitat. — Forest brooks in low country.

### *Prodasineura hosei* (LAIDLAW)

*Disparoneura hosei* LAIDLAW, 1913, Proc. Zool. Soc. London : 76-78 — ♂ Sarawak (N. W. Borneo).

- *Prodasineura hosei* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 520, 525; KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 93 (♂ ♀ Sarawak); LIEFTINCK, 1948, Treubia, 19 : 231-232, fig. 4 (♂ app., W. Borneo).

Range. — Borneo (west and northwest).

Habitat. — Brooks in lowland forest.

***Prodasineura hyperythra* (SELYS)**

- Alloneura hyperythra* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 180-181. — ♂ N. Borneo.
- Disparoneura moultoni* LAIDLAW, 1912, J. Str. Br. R. Asiatic Soc. 63 : 93, 98-99 (♂ N. Sarawak); LAIDLAW, 1913, Proc. Zool. Soc. London : 76 (notes).
- Disparoneura hyperythra* LAIDLAW, 1913, Proc. Zool. Soc. London : 76 (key).
- Caconeura moultoni* LAIDLAW, 1920, Proc. Zool. Soc. London : 340 (♂ descr. notes, Sarawak).
- Caconeura hyperythra* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 247 (♂ N. Borneo).
- Prodasineura hyperythra* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 94 (♂ Sarawak); COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 521, 525.

Range. — Borneo (west, north and east).

Habitat. — Forest streams in low country.

***Prodasineura interrupta* (SELYS)**

- Alloneura interrupta* SELYS, 1860, Bull. Acad. Belg. (2) 10 : 453-454. — ♂ Singapore (Malaya).<sup>1)</sup>
- Disparoneura interrupta* FÖRSTER in LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 15 ("Sumatra, Singapore").
- Caconeura interrupta* LAIDLAW, 1920, Proc. Zool. Soc. London : 339 (Borneo, not seen); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 191-192 (Malaya, notes, not seen).
- Prodasineura interrupta* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 521, 525; LIEFTINCK, 1951, Idea, 8 : 74, 83 (key).

Range. — Malaya; Singapore I.

Sumatra (south); Billiton.

Borneo (west, south and southeast).

Habitat. — Sluggish streams and brooks in lowland forest.

***Prodasineura laidlawii* (FÖRSTER)**

- Disparoneura notostigma laidlawii* FÖRSTER in LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 12-13. — Jor (Perak, Malaya).
- Caconeura laidlawii* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 192 (♂ Malaya).
- Prodasineura laidlawii* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 521, 525; FRASER, 1942, Proc. R. Ent. Soc. London (B) 11 : 96 (♂♀ Malaya; Penang; notes); LIEFTINCK, 1951, Idea, 8 : 74, 82 (key).

Range. — Penang; Malaya.

Remarks. — I have seen specimens from Kedah in Perak (600-700 m) and Pahang in Malaya, as well as from Penang I.

<sup>1)</sup> The type from Singapore, and a second ♂ labelled "Mal"(acca), both in the Brussels Museum, compare well with our series from Sumatra, Billiton and Borneo.

**Prodasineura lansbergei (SELYS)**

*Alloneura lansbergei* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 178-179. — ♂ Borneo (?).

*Prodasineura lansbergei* LIEFTINCK, 1951, Idea, 8 : 74, 75-76 (notes).

Range. — Borneo (?)

Remarks. — I have not seen the type (the only specimen known), which is probably no more in existence.

**Prodasineura notostigma (SELYS)**

*Alloneura notostigma* SELYS, 1860, Bull. Acad. Belg. (2) 10 : 452-453. — ♂ ♀ Singapore (Malaya).

*Disparoneura notostigma* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 174 (add. notes, Singapore); SELYS, 1889, Ann. Mus. civ. Genova, 27 : 484 (Bangka).

*Disparoneura notostigma* FÖRSTER in LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 12 (♂ ♀ Malaya).

*Caconeura notostigma* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 191 (♂ ♀ Malaya); LAIDLAW, 1934, ibid. 17 : 553 (Kedah Peak); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 8-9 (♂ ♀ S. Sumatra; P. Tioman; Borneo; colour-notes).

*Prodasineura notostigma* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 521, 525; FRASER, 1942, Proc. R. Ent. Soc. London (B) 11 : 96 (♂ Kedah; "confined to Malaya"); LIEFTINCK, 1951, Idea, 8 : 74, 82-83 (key).

Range. — Malaya; Singapore I.; Tioman I.  
Sumatra (south); Bangka.  
Borneo (west and northwest).

Habitat. — In south Sumatra I found this species in the rocky bed of forest streams, 300-500 m; and it was caught at 1000-1100 m on Mt. Jerai (Kedah Peak, Malaya). Occurs also on brooks with slow flowing water in very low country.

**Prodasineura peramoena (LAIDLAW)**

*Disparoneura peramoena* LAIDLAW, 1913, Proc. Zool. Soc. London : 76-77, pl. 4, fig. 8, 8 a (♀ proth., ♂ app.) — ♂ ♀ Sarawak (N. W. Borneo).

*Prodasineura peramoena* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 521, 523; KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 94 (♂ ♀ Sarawak).

Range. — Borneo (northwest).

Habitat. — Known only from Mt. Dulit in Sarawak, up to about 850 m.

**Prodasineura quadristigma LIEFTINCK**

*Prodasineura quadristigma* LIEFTINCK, 1951, Idea, 8 : 80-82, 83 (key), fig. 3, 4, 7, 8, 9, 14-16 (♂ ♀ head & thor., pterost., app. & proth.) — ♂ ♀ S. E. Borneo.

Range. — Borneo (southeast).



**Prodasineura tenebricosa** LIEFTINCK

*Prodasineura tenebricosa* LIEFTINCK, 1937, *Treubia*, 16 : 82-84, fig. 15 (♂ app.) —  
♂♀ W. Borneo.

Range. — Borneo (west and south).

Habitat. — Forest brooks in the lowlands of western Borneo, but also occurring along the mud-banks of wide rivers with a slow current; probably chiefly a riverine breeder (south Borneo). Oviposits *per collum* in pendant submerged root masses of trees overhanging the water.

**Prodasineura verticalis** (SELYS)<sup>1)</sup>

*Alloneura verticalis* SELYS, 1860, *Bull. Acad. Belg.* (2) 10 : 453. — ♂ Sarawak (N. W. Borneo).

*Alloneura humeralis* SELYS, 1860, *Bull. Acad. Belg.* (2) 10 : 454-455 (♂♀ Malaya).

*Disparoneura verticalis* SELYS, 1886, *Mém. cour. Acad. Belg.* 38 (4) : 176 (♂ — not ♀ — Borneo); SELYS, 1889, *Ann. Mus. civ. Genova*, 27 : 484 (notes venation; Nias, Sumatra); KRÜGER, 1898, *Stett. ent. Ztg.* 59 : 114 (Sumatra, Nias, Borneo, not seen); FÖRSTER in LAIDLAW, 1907, *Fasc. Malayenses, Zool.* 4, *Odon.* 2 : 14-15, notes (*Disp. v. verticalis*, Borneo; *Disp. v. delia*, Sumatra, Java; *Disp. v. humeralis*, Malaya; *Disp. v. humeralis* var. *nigra*, Malaya); LAIDLAW, 1913, *Proc. Zool. Soc. London* : 75-76, notes & key (*Disp. verticalis* + *delia* + *humeralis* + *nigra*).

*Disparoneura humeralis* SELYS, 1886, *Mém. cour. Acad. Belg.* 38 (4) : 171-172 (add. descr., Malaya); LAIDLAW, 1902, *Proc. Zool. Soc. London*, 2 : 384 (♂♀ Malaya); RIS, 1912, *Tijdschr. Ent.* 55 : 161, pl. 7, fig. 3 (♂ app., S. E. Java).

*Disparoneura delia* KARSCH, 1891, *Entom. Nachr.* 17 : 242-243 (♂ — ♀ *ex err.* — N. E. Sumatra); KRÜGER, 1898, *Stett. ent. Ztg.* 59 : 111 (♂ N. E. Sumatra); RIS, 1915, *Tijdschr. Ent.* 58 : 8, fig. 3 (♀ proth., ♂♀ Simalur).

*Disparoneura arba* KRÜGER, 1898, *Stett. ent. Ztg.* 59 : 112-114 (♂♀ N. E. Sumatra).

*Caconeura verticalis* LAIDLAW, 1920, *Proc. Zool. Soc. London* : 339 (♂♀ N. W. Borneo, note); LIEFTINCK, 1931, *Misc. Zool. Sum.* 59 : 3-4 (note; Nias).

*Caconeura verticalis karnyi* LAIDLAW, 1926, *J. Mal. Br. R. Asiatic Soc.* 4 : 230-231 (♂ Mentawai Is.).

*Disparoneura delia arba* RIS, 1927, *Zool. Meded.* 10 : 20-21 (descr. notes, ♂♀ C. Sumatra).

*Caconeura humeralis* LIEFTINCK, 1930, *Treubia*, 12 : 151 (key); LAIDLAW, 1931, *J. Fed. Mal. States Mus.* 16 : 190-191 (notes, ♂ Siam, ♂♀ Malaya, incl. var. *nigra*); LIEFTINCK, 1934, *Treubia*, 14 : 391-392 (Java, notes, not seen).

*Caconeura delia delia* LIEFTINCK, 1931, *Misc. Zool. Sum.* 59 : 4 (notes genit. & supposed synonymy; ♂♀ Nias).

*Caconeura verticalis verticalis* FRASER, 1933, *Fauna Brit. India, Odon.* 1 : 212, 213-214 (*pars*: Borneo; Lower Burma).

<sup>1)</sup> This is an extremely variable species. I am deliberately of opinion that *humeralis* is not specifically distinct from *verticalis* and that it can probably not even be ranked as a subspecies. In regard to the thoracic colour-pattern of the ♂, Bornean populations are, admittedly, very constant.

- Disparoneura delia delia* SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 337-339 (♂ ♀ N. E. & S. Sumatra, ♀ Simalur), fig. 31-32 (♂ ♀ thor.).
- Disparoneura delia risi* SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 337 (key), 338-339 (♂ ♀ C. Sumatra), fig. 33-34 (♂ thor., ♀ proth.).
- Caconeura verticalis delia* LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 9 (notes structure & synon.; Sumatra, loc. diff.).
- Prodasineura verticalis* COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 520-521, 525-526 (spp. included: *delia*, *humeralis*); KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 93 (♂ Sarawak).
- Prodasineura verticalis delia* LIEFTINCK, 1948, Treubia, 19 : 284 (Sumatra, Simalur, Nias, Mentawai Is.).

Range. — Siam; Malaya.

P. Wé; Simalur; Nias; Siberut (Mentawai Is.); Sumatra (universal); Billiton.

Java (Djokjakarta, southcoast).

Borneo (west and northwest).

Habitat. — Widely distributed and generally common on streams and brooks in low-lying wooded districts.

#### Genus NOTONEURA TILLYARD

*Notoneura* TILLYARD, 1913, Proc. Linn. Soc. N. S. Wales, 37 : 430;

COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 512, 521-522.

(Genotype: *Alloneura solitaria* TILLYARD, ♂ ♀ Queensland)

#### *Notoneura insignis* (SELYS)

*Alloneura insignis* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 181-182. — ♂ Java (?), ♀ Sumatra.

*Alloneura insignis* SELYS, 1889, Ann. Mus. civ. Genova, 27 : 484 (note).

*Alloneura fruhstorferi* KRÜGER, 1898, Stett. ent. Ztg. 59 : 138-139 (♂ Java).

*Caconeura fruhstorferi* RIS, 1912, Tijdschr. Ent. 55 : 161-162, pl. 7, fig. 4 a-b (♂ app., S. Java); RIS, 1913, Abh. Senckenb. naturf. Ges. 34 : 508 (key), 512 (♂ Java); FRASER, 1926, Treubia, 8 : 493 (♂ hab. ign., note).

*Caconeura insignis* KENNEDY, 1917, Ent. News, 28, pl. 21, fig. 15-16 (penis, Java).

*Risioneura fruhstorferi* LIEFTINCK, 1930, Treubia, 12 : 147-151 (Java, Sumatra), fig. 13-16 (♂ ♀ thor., ♂ wing-bases & app., ♀ proth., Java); SCHMIDT, 1934, Arch. Hydrob. Suppl. 13 : 336 (♂ E. Java).

*Notoneura insignis* LIEFTINCK, 1934, Treubia, 14 : 392 (Java, notes); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 9 (S. Sumatra); COWLEY, 1936, Ann. Mag. Nat. Hist. (10) 17 : 522, 525; LIEFTINCK, 1953, Verh. Naturf. Ges. Basel, 64 : 127, 150-151 (Bali, notes).

Range. — Sumatra (southwest and south).

Java (universal); Bali.

Habitat. — Forest streams, from near sea-level up to about 1000 m.



## Family PLATYCNEMIDIDAE

## Genus CALICNEMIA STRAND

*Calicnemia* STRAND, 1926, Arch. Naturgesch. 92A : 46.

*Calicnemis* SELYS, 1893, Bull. Acad. Belg. (2) 16 : 159 (*nom. praecoc.*)

(Genotype: *Calicnemis eximia* SELYS, ♂ Ind. or. = India)

***Calicnemia chaseni* (LAIDLAW)**

*Calicnemis chaseni* LAIDLAW, 1928, Proc. Zool. Soc. London : 136. — ♂ Pahang (Malaya).

*Calicnemis chaseni* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 193 (♂ Perak, note).

*Calicnemia chaseni* LAIDLAW, 1933, Bull. Raffles Mus. 7 : 98, fig. 2 b (♂ app., type); LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 553 (Pahang).

Range. — Malaya.

Habitat. — Submontane hills of Perak and Pahang, probably up to 1600 m. Members of this genus breed in small brooks flowing through marshes, but nothing is known in this respect of the regional species.

***Calicnemia rectangulata* LAIDLAW**

*Calicnemia rectangulata* LAIDLAW, 1933, Bull. Raffles Mus. 7 (1932) : 97-98, fig. 2 a (♂ app.) — ♂ Pahang (Malaya).

*Calicnemia rectangulata* LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 552, 553 (Malay States); FRASER, 1942, Proc. R. Ent. Soc. London (B) 11 : 96-97, fig. 1 c (♂ app., Malaya).

Range. — Malaya.

Habitat. — Recorded from the hills in Perak, 600-1300 m, and Pahang, 1600 m.

## Genus COELICCIA KIRBY

*Coelliccia* KIRBY, 1890, Syn. Cat. Neur. Odon. : 128.

(Genotype: *Platycnemis membranipes* RAMBUR, ♀ Java)

***Coelliccia albicauda* (FÖRSTER)**

*Trichocnemis octogesima albicauda* FÖRSTER in LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 5-6. — ♂ Jor (Perak, Malaya).

*Trichocnemis borneensis* LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 6-7 (♂♀ Kelantan).

*Coelliccia albicauda* LAIDLAW, 1917, Rec. Ind. Mus. 13 : 336 (♂♀ Malaya, notes); LAIDLAW, 1918, Proc. Zool. Soc. London : 230 (note); LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 195, fig. 4 (♂ app., Malaya); LAIDLAW, 1932, Rec. Ind. Mus. 34 : 39-40 (♂♀ Pahang), pl. 1, fig. 1 & 23 (penis), pl. 2, fig. 23-24 (♂ app.),



pl. 3, fig. 10 (♂ thor.); LAIDLAW, 1934, J. Fed. Mal. States Mus. 17 : 552 (Pahang).

Range. — Malaya.

Habitat. — Apparently known only from Pahang and Kelantan, 600-1200 m.

### *Coeliccia arcuata* LIEFTINCK

*Coeliccia arcuata* LIEFTINCK, 1940, Treubia, 17 : 333-355, fig. 7-8 (♂ app., ♀ proth.)  
— ♂ ♀ E. Borneo.

Range. — Borneo (east).

Habitat. — Swampy forest in low country.

### *Coeliccia borneensis* (SELYS)

*Trichocnemis borneensis* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 116-117. — ♀  
N. Borneo.

*Coeliccia borneensis* LAIDLAW, 1932, Rec. Ind. Mus. 34 : 12, 41-42 (♀ descr., not  
seen).

Range. — Borneo (north).

Remarks. — Known only from the type locality. Male unknown.

### *Coeliccia campioni* LAIDLAW

*Coeliccia campioni* LAIDLAW, 1918, Proc. Zool. Soc. London : 224-225, fig. 3-4 (♂  
wings, app.) — ♂ Sarawak (N. W. Borneo).

*Coeliccia campioni* LAIDLAW, 1932, Rec. Ind. Mus. 34 : 36-37 (♂ ♀ Sarawak), fig. 2  
a-b (♀ proth.), pl. 1, fig. 6 (penis), pl. 2, fig. 5-6 (♂ app.), pl. 3, fig. 5 (♂ thor.);  
KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 88 (♂ ♀ Sarawak, note).

Range. — Borneo (northwest).

Habitat. — A species of the lowland forests.

### *Coeliccia coomansi* LIEFTINCK

*Coeliccia coomansi* LIEFTINCK, 1940, Treubia, 17 : 355-356, fig. 9-16 (♂ app., ♀ proth.)  
♂ ♀ W. Borneo.

Range. — Borneo (west).

Habitat. — Mt. Poteng, near Singkawang, 400 m.

### *Coeliccia cyaneothorax* KIMMINS

*Coeliccia cyaneothorax* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 89-91, fig. 10  
a-c (♂ thor. & app.) — ♂ Sarawak (N. W. Borneo).

Range. — Borneo (northwest).

Habitat. — Mt. Dulit in Sarawak, about 800 m.

***Coeliccia didyma* (SELYS) <sup>1)</sup>**

*Trichocnemis didyma* SELYS, 1863, Bull. Acad. Belg. (2) 16 : 153-159. — ♂ Tibet.

*Trichocnemis octogesima* LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 2 (♂ Malaya).

*Coeliccia simillima* LAIDLAW, 1917, Rec. Ind. Mus. 13 : 332 (key), 334-335 (♂ ♀ Malaya).

*Coeliccia didyma* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 194-195 (♂ Khao Luang, S. Siam); LAIDLAW, 1934, *ibid.* 17 : 552 (Perak).

Range. — Malaya (north).

Remarks. — A widely spread species, ranging from Simla to the north of the Malay Peninsula (LAIDLAW, 1932). In Perak it occurs at 1000-1200 m.

***Coeliccia erici* LAIDLAW**

*Coeliccia erici* LAIDLAW, 1917, Rec. Ind. Mus. 13 : 332 (key), 334, fig. 3 (♂ app.) — ♂ ♀ Jalor (S. Siam).

*Trichocnemis renifera* race? LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 2 (♂ ♀ same loc.)

*Coeliccia erici* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 195, fig. 3 (♂ app., Malaya); LAIDLAW, 1932, Rec. Ind. Mus. 34 : 20-21, pl. 1, fig. 13, 25 (penis), pl. 2, fig. 1-2 (♂ app.), pl. 3, fig. 11 (♂ thor.).

Range. — Siam; Malaya.

Habitat. — Originally described from Bukit Besar, about 800 m, but later reported also from Perak (500 m) and Pahang.

***Coeliccia flavostriata* LAIDLAW**

*Coeliccia flavostriata* LAIDLAW, 1918, Proc. Zool. Soc. London : 223-224, fig. 1-2 (♂ wings & app.) — ♂ Sarawak (N. W. Borneo).

*Coeliccia flavostriata* LAIDLAW, 1932, Rec. Ind. Mus. 34 : 34-35 (♂ Sarawak).

Range. — Borneo (northwest).

Habitat. — Only known from the Sarawak hills.

***Coeliccia lieftincki* LAIDLAW**

*Coeliccia lieftincki* LAIDLAW, 1932, Rec. Ind. Mus. 34 : 32-33, pl. 1, fig. 8, 14 (penis), pl! 2, fig. 13-14 (♂ app.), pl. 3, fig. 2 (♂ thor.) — ♂ ♀ S. Java.

*Coeliccia lieftincki* LIEFTINCK, 1934, Treubia, 14 : 392 (Java, notes).

Range. — Java (west and central south).

Habitat. — Runnels in forest marshes, from near sea-level up to about 900 m.

<sup>1)</sup> I am not at all convinced that *C. simillima* LAIDLAW should not be specifically distinct from *didyma* (SELYS). Cf LAIDLAW, 1932, Rec. Ind. Mus. 34 : 17.

*Coeliccia membranipes* LAIDLAW, 1932, Rec. Ind. Mus. 34 : 30-32 (♂ ♀ N. Borneo),  
pl. 1, fig. 3, 17 (penis), pl. 2, fig. 15-16 (♂ app.), pl. 3, fig. 13 (♂ thor.).

Range. — Borneo (north).

Habitat. — Recorded from the submontane zone, Mt. Kinabalu (1000-1800 m) and Mt. Batu Lawi (1200 m).

*Coeliccia nigrescens* LAIDLAW

*Coeliccia nigrescens* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 196-197, fig. 5  
(♂ app.) — ♂ Peninsular Siam.

Range. — Siam.

*Coeliccia nigrohamata* (SELYS)<sup>1)</sup>

*Coeliccia nigrohamata* LAIDLAW, 1918, Proc. Zool. Soc. London : 228, fig. 7, 8 (♂  
wings & app.) — ♂ Sarawak (N. W. Borneo).

*Coeliccia nigrohamata* LAIDLAW, 1932, Rec. Ind. Mus. 34 : 37-38 (♂ ♀ Sarawak),  
fig. 3 a-b (♀ proth.), pl. 3, fig. 15-16 (♂ ♀ thor.); KIMMINS, 1936, J. Fed. Mal.  
States Mus. 18 : 88-89 (♂ ♀ Sarawak); LIEFTINCK, 1953, Treubia, 22 : 238-239  
(comp. notes).

Range. — Borneo (northwest).

*Coeliccia octogesima* (SELYS)<sup>2)</sup>

*Trichocnemis octogesima* SELYS, 1863, Bull. Acad. Belg. (2) 16 : 157-158. — ♀ Singa-  
pore (Malaya).

*Trichocnemis octogesima* SELYS, 1886, Mém. cour. Acad. Belg. 38 (4) : 117-118  
(♀ Singapore; ♂ Labuan, Borneo); KRÜGER, 1898, Stett. ent. Ztg. 59 : 102 (♂ ♀  
N. E. Sumatra).

*Coeliccia octogesima* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 196 (note);  
LAIDLAW, 1932, Rec. Ind. Mus. 34 : 40-41 (orig. descr. quoted; type designations  
transposed!); LIEFTINCK, 1940, Treubia, 17 : 357, fig. 11-12 (♀ thor., pterost.  
& proth.; holotype Singapore re-descr.).

Range. — Malaya (Singapore).

Sumatra (northeast).

Borneo (north).

*Coeliccia resecta* LIEFTINCK

*Coeliccia resecta* LIEFTINCK, 1953, Treubia, 22 : 236-239, fig. 3 (♂ thor. & app.) — ♂  
S. E. Borneo.

Range. — Borneo (southeast and south).

Habitat. — Forest marshes in low country.

<sup>1)</sup> The two sexes described by LAIDLAW in 1932 are doubtfully conspecific.

<sup>2)</sup> The two sexes described by SELYS in 1886 are doubtfully conspecific. I have  
t seen Sumatran specimens.



Genus **RISIOCNEMIS** COWLEY*Risioenemis* COWLEY, 1934, Entomologist, 67 : 204.(Genotype: *Hypocnemis serrata* SELYS, ♂ Manila)*Prionocnemis* SELYS, 1886, Mémoires cour. Acad. Belg. 38 (4) : 223 (nom. praecoc.)**Risioenemis incisa** KIMMINS

- *Risioenemis incisa* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 91-92, fig. 11 (♀ proth.) — ♀ N. W. Borneo.

- Range. — Borneo (northwest).

- Remarks. — Known only from the type locality. Male unknown.

**Risioenemis reflexa** KIMMINS*Risioenemis reflexa* KIMMINS, 1936, J. Fed. Mal. States Mus. 18 : 92-93, fig. 12 (♀ proth.) — ♀ N. W. Borneo.

- Range. — Borneo (northwest).

- Remarks. — Known only from the type locality. Male unknown.

Genus **INDOCNEMIS** LAIDLAW*Indocnemis* LAIDLAW, 1917, Rec. Ind. Mus. 13 : 325-326.(Genotype: *Indocnemis kempi* LAIDLAW, ♂ Assam)**Indocnemis orang** (FÖRSTER)*Trichocnemis orang* FÖRSTER in LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 2-4. — ♂ ♀ Jor (Perak, Malaya).

- *Indocnemis orang* LAIDLAW, 1931, J. Fed. Mal. States Mus. 16 : 193-194, (♂ ♀ Malaya; ♂ ♀ Siam); LIEFTINCK, 1935, Misc. Zool. Sum. 92-93 : 8 (♂ Sumatra)<sup>1)</sup>.

- Range. — Siam; Malaya.

Genus **COPERA** KIRBY*Copera* KIRBY, 1890, Syn. Cat. Neur. Odon.: 129.(Genotype: *Platycnemis marginipes* RAMBUR, ♂ Java).**Copera annulata** (SELYS)*Psilocnemis annulata* SELYS, 1863, Bull. Acad. Belg. (2) 16 : 172-173. — ♂ ♀ Shanghai (China).

- *Psilocnemis ciliata* SELYS, 1863, Bull. Acad. Belg. (2) 16 : 173 (♀ Malaya).

- *Psilocnemis annulata* race *C. ciliata* SELYS, 1886, Mémoires cour. Acad. Belg. 38 (4) : 125-126 (Malaya & Sumatra); KRÜGER, 1898, Stett. ent. Ztg. 59 : 107 (♂ ♀ N. E. Sumatra).

- *Copera ciliata* LAIDLAW, 1907, Fasc. Malayenses, Zool. 4, Odon. 2 : 8 (♂ Perak).

<sup>1)</sup> Of doubtful occurrence; based on a single ♂ in the Hamburg Museum, labelled "Sumatra, B. JACHAN".