a Helodid, placed under that family, and hence was not submitted to Dr. Schenkling with the other Clerides.

11. Allochotes praslinensis, sp. n.

♂. Broad oval, shining, thickly clothed with rather long, semi-erect yellowish hairs; testaceous, the eyes, tips of the mandibles, and elytra (a common sutural stripe extending down the basal two-thirds excepted) black; the head and prothorax sparsely, minutely, the elytra more closely and much more distinctly, punctured, the space occupied by the sutural stripe with numerous coarser punctures intermixed. Head short, broad, truncate at the apex, leaving the mandibles partly exposed, hollowed in the middle anteriorly, the epistoma confused with the front; eyes very large, emarginate in front; antennæ moderately elongate, joints 2 and 3 small, 4–10 triangular, stout, rapidly widening, about as long as broad, 10 subtransverse, 11 ovate. Prothorax transverse, much wider than the head, moderately convex, rounded at the sides. Elytra convex, broad, transversely subcordate, greatly dilated at the sides anteriorly, at the base not wider than the prothorax, the humeral callosities not very prominent. Legs stout.

Length (extended) 3¼, breadth 2¼ mm.

Loc. Seychelles: Praslin, xi. 1908, one ♂.

This insect, when rolled up (*i.e.* with the head and prothorax deflexed), has the general facies of a *Corynetes* or *Scirtes*. There are one or two similarly-coloured allied unnamed forms from Ceylon in the British Museum. The present species is doubtless a native of the Seychelles.

XVII. *The Dragonflies (Order* Odonata*) of Fiji, with special reference to a collection made by Mr. H. W. Simmonds, F.E.S., on the Island of Viti Levu.*

By R. J. Tillyard, M.A., Sc.D.(Cantab.), D.Sc.(Sydney), C.M.Z.S., F.L.S., F.E.S., Entomologist and Chief of the Biological Department, Cawthron Institute, Nelson, N.Z.

[Read October 3rd, 1923.]

(With Twenty-one Text-figures.)

Up to the present time little work has been done upon the Odonata of the Fiji Islands, the only outstanding contribution to our knowledge being the fine paper by de Selys on the genus *Nesobasis* (Ann. Soc. Ent. Belg., xxxv, 1891, pp. li–lvii, Brussels). Including the five species of this genus, all of which are peculiar to the Fiji Islands, only sixteen species have so far been recorded for the group, and several of these are widely spread in Australia and the Pacific Islands.

In June, 1919, Mr. H. W. Simmonds, F.E.S., Acting Government Entomologist in Fiji, wrote to me to ask me to name a specimen of a common dragonfly caught on the Waidoi Estate near Navua, Viti Levu, where he was then stationed. In replying to his letter, I drew his attention to de Selys' work on the genus *Nesobasis*, and suggested that the Zygoptera of Fiji would be well worth collecting, and that very probably some new species of this interesting genus would soon be discovered. Mr. Simmonds acted upon this advice, and proceeded to collect Odonata, particularly Zygoptera, with great vigour during the remainder of his stay at Waidoi, viz. from August to November of the year 1919. Fortunately Mr. Simmonds is gifted with great skill as an artist in colours, and willingly acted on a suggestion which I made to him that he should make water-colour drawings of all the species taken before their colours faded.

The result was a fine series of coloured drawings which are well worthy of publication, were it not for the prohibitive cost of coloured plates at the present time. During that time, Mr. Simmonds collected, in spite of very bad weather, no less than 170 specimens of Odonata. These were forwarded to me in several consignments, and together constitute what I propose to designate as the Simmonds Collection in this paper. Nearly all of these were taken in and around Waidoi, a plantation situated not far from Navua on the Island of Viti Levu. Of this region, Mr. Simmonds says: "This belt of country is different from most of Fiji, and is geologically the oldest portion. From a few miles west of Suva to a few miles west of Navua, there is a belt of volcanic country subjected to a rainfall of 180 inches and upwards per annum. It has many clear water streams flowing through heavy forest. It is here that almost all the species have been taken."

The Simmonds Collection, when analysed, is found to contain twenty-three species, of which no less than thirteen are new to science. Of the new species, all of which belong to the Zygoptera, ten are referable to the genus *Nesobasis*, which is the dominant genus of dragonflies in the group, one to *Pseudagrion*, one to *Agriocnemis*, and one to *Austrolestes*, the latter being the first record, as far as I know, of a representative of the family Lestidae in these Islands. As only ten species already recorded from the group are absent from the Simmonds Collection, I thought it advisable to include these also in the paper, so as to make a comprehensive survey of the total known Odonate fauna of the Islands.

Before proceeding to enumerate and describe the species, I wish to express my great admiration for the careful way in which Mr. Simmonds carried out the work of collecting these insects. Not only was each specimen carefully papered, with locality and date, but most of the specimens had very detailed notes as to coloration, etc., and the particular specimens drawn in colours were all specially labelled. It has been a great pleasure to work through such a well-prepared collection, and I wish to express to Mr. Simmonds my very sincere thanks for the opportunity of so doing. I also wish to thank Mr. Herbert Campion, Odonatologist in the British Museum of Natural History, for his valuable help in collecting together a complete record of the Odonata of these Islands.

The holotypes and allotypes of the new species described in this paper have been placed in the Cawthron Institute Collection. New Zealand being comparatively close to Fiji, this should facilitate any further work which may be carried out in the study of Fijian Odonata. Mr. Simmonds desired that named paratypes of the new species, where available, and also named duplicates of species already known, should be sent by me to the British Museum, and also to the Dominion Museum, Wellington; this has already been done. Further named specimens have also been sent to the Department of Agriculture at Suva, Fiji, together with the series of coloured drawings made by Mr. Simmonds, which should be most useful for reference on the spot. In the descriptions of new species given in this paper, full use has been made of Mr. Simmonds' copious notes on coloration, etc., and the coloured drawings have also been carefully studied so that the correct colours might be embodied in the description wherever possible. Thus it will be seen that, in dealing with *Nesobasis erythrops* Selys, the last two segments of the abdomen are shown to be marked with bright blue above. This colour was not noticed by de Selys, and would probably not have been noticed by me either, if I had not had Mr. Simmonds' note and drawing before me, so that I could turn to the faded specimen and by careful study make out the exact area of the blue coloration, which fades in the dead insect almost to black. Several other instances could be given where very bright colours, chiefly blue, had so faded that they could well have been overlooked in the description.

The paper concludes with a short analysis of the zoogeographical elements which make up the Fijian Odonate fauna.

The following is a complete list of the known dragonflies of the Fiji Islands, those species marked with an asterisk being absent from the Simmonds Collection. No doubt many more species could be added if other islands besides Viti Levu were to be carefully worked.

Sub-order *ZYGOPTERA*.

Family LESTIDAE.

1. *Austrolestes vitiensis* n. sp.

Family AGRIONIDAE.

2. *Pseudagrion pacificum* n. sp.
3. *Nesobasis erythrops* Selys.
*4. ,, *telegastrum* Selys.
*5. ,, *longistyla* Selys.
6. ,, *flavilabris* Selys.
7. ,, *corniculata* n. sp.
8. ,, *simmondsi* n. sp.
9. ,, *comosa* n. sp.
*10. ,, *nigrostigma* Selys.
11. ,, *angulicollis* n. sp.
12. ,, *subhumeralis* n. sp.
13. ,, *selysi* n. sp.
14. ,, *campioni* n. sp.
15. ,, *aurantiaca* n. sp.
16. ,, *brachycerca* n. sp.
17. ,, *heteroneura* n. sp.
18. *Agriocnemis exsudans* Selys.
19. ,, *vitiensis* n. sp.
20. *Ischnura heterosticta* Burm.
21. ,, *aurora* Br.

Sub-order *ANISOPTERA.*

Family AESCHNIDAE.

22. *Anaciaeschna jaspidea* (Burm.).

Family LIBELLULIDAE.

*23. *Synthemis macrostigma macrostigma* Selys.
24. *Procordulia irregularis* Martin.
*25. *Hemicordulia tau* Selys.
*26. *Hypothemis hageni* Karsch.
27. *Orthetrum sabina* (Drury).
*28. *Lathrecista asiatica asiatica* (Fabr.).
29. *Diplacodes bipunctata* (Br.).
*30. *Diplacodes trivialis* (Ramb.).
*31. *Pantala flavescens* (Fabr.).
*32. *Tramea limbata* (Desjardins).
33. *Rhyothemis phyllis dispar* Br.

Sub-order *ZYGOPTERA.*

Family LESTIDAE.

Genus AUSTROLESTES Till.

1. **Austrolestes vitiensis**, n. sp.

(Text-fig. 1.)

♂. *Total length* 42, *abdomen* 34, *fore-wing* 22 mm.

Head:—*Eyes* dark blue above, light blue beneath. *Antennae* blackish; *ocelli* transparent yellowish brown. *Epicranium, frons*

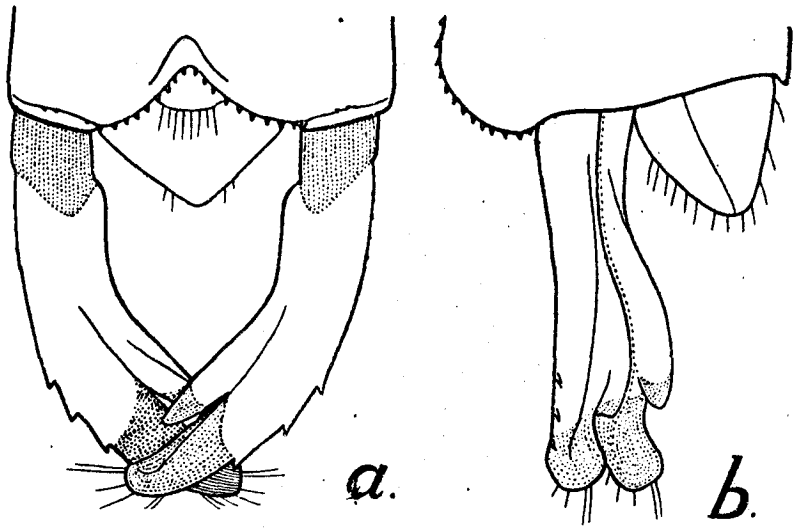

FIG. 1.—*Austrolestes vitiensis* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 40).

and *postclypeus* blackish; *anteclypeus* and *labrum* blue-green; *labium* pale testaceous.

Thorax:—*Prothorax* blackish above, the posterior lobe deep metallic greenish; sides pale testaceous with a superior black patch. *Synthorax* metallic green above, with a narrow dark stripe along the mid-dorsal carina; mesinfraepisternum blackish above, pale testaceous below; humeral suture brownish, with an anterior black mark and a short posterior black stripe. Sides light blue, shading to pale testaceous on breast; first lateral suture with a rather flattened J-shaped mark in middle, metallic green; second lateral suture with a narrow triangular blackish streak posteriorly. *Legs*

pale testaceous, femora striped above and below with blackish, hairs also blackish; tibiae with a blackish stripe above; tarsi and claws blackish.

Abdomen:—dull blackish above, yellowish tinged with blue on sides of 1–5 and basal two-thirds of 6, and patches of same colour low down on sides of 9–10. Seg. 10 with apical margin incised in the middle, denticulate. *Appendages*:—Superiors 1·2 mm., forcipate, stout, very pale straw-coloured, with bases and tips blackish, bases slightly constricted; the outer margin carries three strong teeth on its distal two-fifths; the inner margin has a strong projecting lobe at one-fourth from apex, as shown in Text-fig. 1. Inferiors obsolescent. Seg. 10 carries postero-ventrally a fairly prominent median pyramidal tubercle.

Wings:—hyaline, with blackish venation. *Pterostigma* 1·3 mm., blackish, the veins forming the anterior and posterior margins thickened, jet black, the colouring just within these slightly brownish; covering about two cellules. *Postnodals* 11–12. *Quadrilateral* narrow, with the posterior angle sharply acute, but the distal side is not continued straight on to the posterior border of the wing as in *A. cingulatus* Burm. and some other species of the genus.

♀. *Total length* 40, *abdomen* 32·5, *fore-wing* 23 mm.

Generally similar to male, but with the thorax a little larger, the abdomen a little shorter and considerably stouter, more cylindrical. It differs in the following points:—*Eyes* pale greenish beneath. *Legs* brownish, the femora and tibiae with black stripes above, the knees strongly black. *Abdomen* with 1–2 metallic greenish above, sides yellowish; rest of abdomen dark bronze-green above, the sides light brown. *Appendages* 0·6 mm., narrowly conical, pale testaceous. Ovipositor reaching to about end of seg. 10. *Wings* with pterostigma 1·6 mm. long, and 12–13 postnodals.

Types:—A unique pair, holotype male and allotype female, in Cawthron Institute Collection.

Habitat:—Suva, Fiji Is., taken by Mr. H. W. Simmonds on Dec. 21st, 1919.

This species would appear to be rather closely allied to *A. paludosus* Till., from N. Queensland, but is easily distinguished from it by the metallic-green colouring of the thorax and the form of the internal lobe of the superior appendages of the male, which comes closest in shape to that of the very distinct *A. aridus* Till. from Central Australia.

Family AGRIONIDAE.

Genus PSEUDAGRION Selys.

2. Pseudagrion pacificum, n. sp.

(Text-figs. 2, 3.)

♂. *Total length* 34, *abdomen* 27·5, *fore-wing* 18 mm.

Head (Text-fig. 2*a*):—*Eyes* blue, bordered with paler blue beneath. *Ocelli* transparent red-brown. *Antennae* with segs. 1–2 blue, the rest missing. *Occiput* with the median area blue with a fine black edging, the postocular areas black, with very large rounded *postocular spots* of a bright blue, not connected by a median line. *Epicranium* bright blue, with an irregular black area on the vertex enclosing the three ocelli; on this area, behind the median ocellus, is a fine dash of blue. *Frons, clypeus* and *labrum* bright blue; a small median black spot at base of frons, and three small black spots at base of postclypeus; *labium* dull brownish.

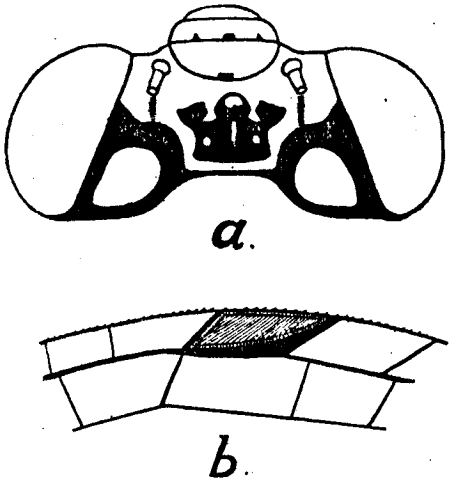

FIG. 2.—*Pseudagrion pacificum* n. sp., ♂. *a*, head, showing colour-pattern of blue and black (× 16). *b*, pterostigma of fore-wing (× 20).

Thorax:—*Prothorax* black above, with a pair of rather large blue spots; sides blue. *Synthorax* bright blue, with a mid-longitudinal band of black, slightly widened in front at the collar; on the anterior two-thirds of this band is a much narrower blue stripe enclosing the dorsal carina, which itself carries a black line; humeral

suture with a well-marked black line; rest of sides bright blue; breast pale brownish. *Legs* dull fuscous above, pale brownish below.

Abdomen:—1–2 bright blue, with a narrow apical ring of black; 2 also with a squarish black patch covering the third quarter of the segment dorsally; 3–7 black above, with a narrow basal blue ring, spreading out distad on the sides; 8–10, bright blue; underside yellowish. *Appendages*:—Superiors, 0·4 mm., black, the apex blunt, bifid in lateral view; seen from above, there is a broad concave lobe extending inwards from base nearly to apex. Inferiors, 0·3 mm., black, subconical, apex broadly rounded. (Text-fig. 3.)

Wings hyaline, with black venation. *Pterostigma* 0·9 mm., covering less than one cellule, trapezoidal, the anterior distal angle very acute, as shown in Text-fig. 2*b*; colour dark fuscous with slightly

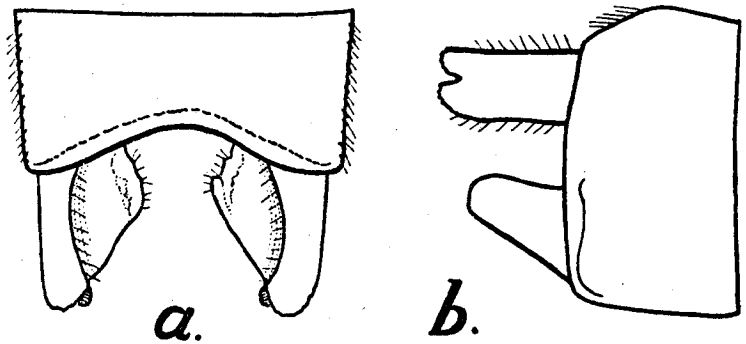

Fig. 3. *Pseudagrion pacificum* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

paler edging, the whole surrounded by very thick black veins. *Postnodals* 12; M_2 arising 5 cellules distad from nodus, and M_{1A} 4 cellules further distad, and only 1 cellule short of the pterostigmatic brace-vein.

♀. Unknown.

Type:—Holotype male in Cawthron Institute Collection.
Habitat:—Waidoi Plantation, Sept. 15th, 1919; taken by Mr. H. W. Simmonds.

This species is clearly allied to *Ps. australasiae* Selys from Australia, but can be at once distinguished from it by the greater amount of blue colouring on head, thorax and abdomen, especially by the blue and black pattern of the head, as shown in Text-fig. 2, the narrowness of the thoracic black bands, the difference in the pattern of seg. 2 of the abdomen, and the fact that the last three segments are

blue, only the last two being blue in the Australian species. The appendages are on a somewhat similar plan, but *Ps. australasiae* has the lower apical lobe of the superior appendage considerably larger than the upper one, and the inferior appendages are much shorter than in the Fijian species.

Genus Nesobasis Selys.

(Text-fig. 4.)

This is the dominant genus of Odonata in the Fiji Islands, and will probably be found to contain a very considerable number of species when the bush streams of the different islands are carefully worked. De Selys originally described five species from Fiji. Of these, only two can be recognised in the present collection; on the other hand, there are no less than eight new species in it which may be referred to this genus, making a total of thirteen. The genus is only represented, outside of the Fiji Islands, by a single species, *N. ciliata* Ris, from Bivak Island, South-west New Guinea; this species differs considerably from the majority of the Fijian species by the shortened and very little zig-zagged Cu_2, and also by the exceedingly close origins of M_3 and Ms.

The species placed in this genus vary greatly in facies, some of them having exceedingly long and slender abdomens, others much shorter ones and comparatively much stouter. They also differ much in coloration, some being marked with bright blue and resembling species of *Pseudagrion*, others being of dull coloration and with more of the facies of *Telebasis*, while one species has both red and blue coloration, as in *Xanthagrion*. It seems clear that the genus could easily be split up into a number of groups of at least subgeneric rank; this should not, however, be attempted until much more material has been collected and studied. In the meanwhile, the genus as it stands can be at once recognised by the combination of the following simple characters:—No bright *postocular spots* present. *Prothorax* similar in both sexes, without any specialised hooks or other armature in the female. *Postnodals* numerous, from 12 to 20 in number. *Anal bridge* (*Ab*, Text-fig. 4) arising at the anal crossing, as in *Pseudagrion* and allies, and the *petiolation* of the wing reaching as far as this, or very slightly beyond; this level is some distance basad from that of the second antenodal.

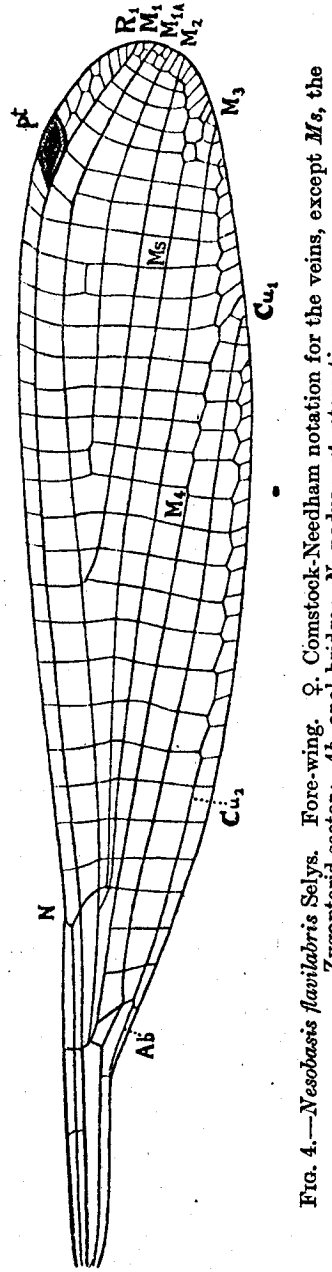

Fig. 4.—*Nesobasis flavilabris* Selys. Fore-wing. ♀. Comstock-Needham notation for the veins, except *Ms*, the Zygopterid sector; *Ab*, anal bridge; *N*, nodus; *pt*, pterostigma.

Genotype:—*Nesobasis erythrops* Selys (by priority of description).

The genus seems to lie between *Austroagrion* and *Xanthocnemis* on the one hand and *Teinobasis* on the other. One of the new species here described (*N. heteroneura* n. sp.) might well be taken for an *Austroagrion* but for the absence of the postocular spots, the considerably longer M_{1A} and Cu_2, and the larger size of the insect; it has the origins of M_3 and Ms not so close together as in the other species. This insect would run down, in a dichotomous key, to the African genus *Argiagrion*, except for its much smaller size; but I have little doubt that other characters would separate it widely from that genus, and have decided to retain it in *Nesobasis* for the present. The known species can then be separated by the following Key:—

KEY TO THE SPECIES OF THE GENUS *NESOBASIS* SELYS.

1. New Guinea species, with the origins of M_3 and Ms exceedingly close together . . . . . *N. ciliata* Ris.
   Fijian species . . . . . 2.
2. Species with the facies of a *Pseudagrion*, the distance between the origins of M_3 and Ms at least as long as the basal descending piece of Ms itself . . . . . *N. heteroneura* n. sp.
   Not such species, the distance between the origins of M_3 and Ms always less than the length of the basal descending piece of Ms . . . . . 3.
3. Eyes, head and thorax bright red, with black markings. *N. erythrops* Selys.
   Coloration not as above . . . . . 4.
4. Abdomen of male excessively long and slender, about 48 mm. *N. telegastrum* Selys.
   Males with the abdomen not excessively long and slender 5.
5. Males bronze black marked with tawny yellow, orange or reddish, including sides of thorax . . . . . 6.
   Species not marked as above . . . . . 9.
6. Superior appendages of male longer than seg. 10, inferiors very short . . . . . *N. longistyla* Selys.
   Appendages not longer than seg. 10 . . . . . 7.
7. Sides of thorax reddish; superior appendages of male excessively short, inferiors somewhat longer . . *N. brachycerca* n. sp.
   Sides of thorax yellow or orange; superior appendages of male longer than inferiors . . . . . 8.

8. Superior appendages of male half as long as seg. 10, inferiors half as long as superiors; posterior lobe of prothorax rounded. *N. nigrostigma* Selys.
   Superior appendages of male about as long as seg. 10, inferiors one-third shorter; posterior lobe of prothorax angulated. *N. aurantiaca* n. sp.
9. Rather large, robust species with dark coloration and without any blue markings; breast black; prothorax not angulated. 10.
   Smaller species with very slender abdomens, coloration bronze-black with bright blue markings, at least on sides of thorax; prothorax angulated postero-laterally . . . . . 13.
10. Labrum pale yellow . . . . . 11.
    Labrum dark . . . . . 12.
11. Labrum entirely yellow, or with only a small basal dark mark; superior appendages of male without any cornicle or tooth. *N. flavilabris* Selys.
    Labrum yellow with a distinct median dark patch at base; superior appendages of male with a small cornicle or tooth close up to apices on inner side . . . *N. corniculata* n. sp.
12. Male with seg. 10 greatly enlarged distally when viewed in profile; inferior appendages longer than superiors. *N. simmondsi* n. sp.
    Male with seg. 10 normal; superior appendages exceedingly hairy and of the same length as inferiors. *N. comosa* n. sp.
13. Abdomen of male with bright blue coloration on segs. 8–10. 14.
    Abdomen of male with segs. 8–10 entirely bronze black or black (rarely a fine blue line bordering segs. 9–10 distally). 15.
14. Segs. 8–10 of male entirely blue dorsally; sides of thorax blue to above humeral suture, with only a short black mark placed anteriorly just below humeral suture . *N. angulicollis* n. sp.
    Seg. 8 of male blue only on distal half, 9–10 blue; sides of thorax blue only up to humeral suture, and having a long black band running beneath that suture for nearly the whole length of the pleuron . . . . . *N. subhumeralis* n. sp.
15. Superior appendages of male shorter than seg. 10, inferiors nearly as long as superiors; sides of thorax black with blue bands . . . . . *N. selysi* n. sp.
    Superior appendages of male longer than seg. 10, inferiors exceedingly short; sides of thorax blue . *N. campioni* n. sp.

3. **Nesobasis erythrops** Selys.

(Text-fig. 5.)

This exceedingly beautiful species has been drawn in colours by Mr. H. W. Simmonds from life; the original description of the dried and faded specimen by de Selys does not do justice to it. The colour of the head, eyes, thorax and sides of segs. 1–2 of the abdomen is a rich cerise, marked with black as described; the black abdomen is relieved apically by segs. 9 and basal half of 10 being bright blue above (this colour was not noticed by de Selys). The appendages of the male are figured in Text-fig. 5; superiors 0·4, inferiors 0·3 mm. long; some specimens have the superior appendages slightly more pointed than here shown. *Pterostigma* 0·5 mm., trapezoidal, reddish.

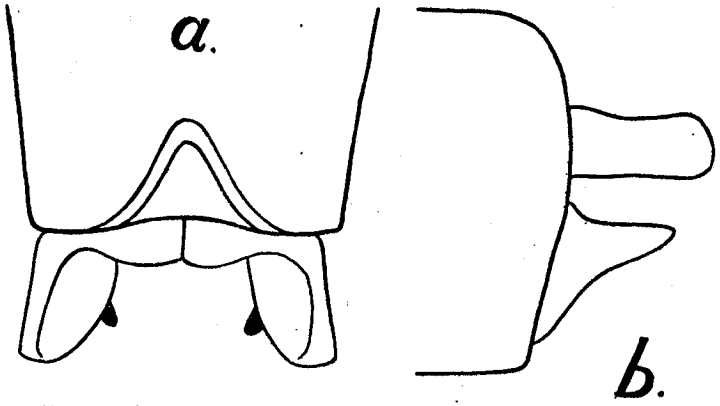

FIG. 5.—*Nesobasis erythrops* Selys, appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

Types:—Male and female, in Godeffroy Museum, Hamburg.

Mr. Simmonds' Collection contains four males of this species, taken on the Waidoi River, Sept. 10th, 11th (two), and Oct. 28th, 1919.

4. **Nesobasis telegastrum** Selys.

This very rare species can be at once recognised by the very long and slender abdomen and the black labrum and postclypeus, separated by the yellow anteclypeus. The appendages would appear to be somewhat similar in form to those of the preceding species.

Type:—Unique male in Godeffroy Museum, Hamburg. Not represented in the Simmonds Collection.

5. Nesobasis longistyla Selys.

Another very rare species, easily recognised by the form of the male appendages, the superiors being straight and longer than seg. 10, the inferiors very short and obtuse.

Type :—Unique male in Godeffroy Museum, Hamburg.

6. Nesobasis flavilabris Selys.

(Text-fig. 6.)

This is one of the commonest species of the genus, and is represented in the Simmonds Collection by no less than twenty-six specimens, thirteen being males and thirteen females, inclusive of six pairs taken *in cop.* These were

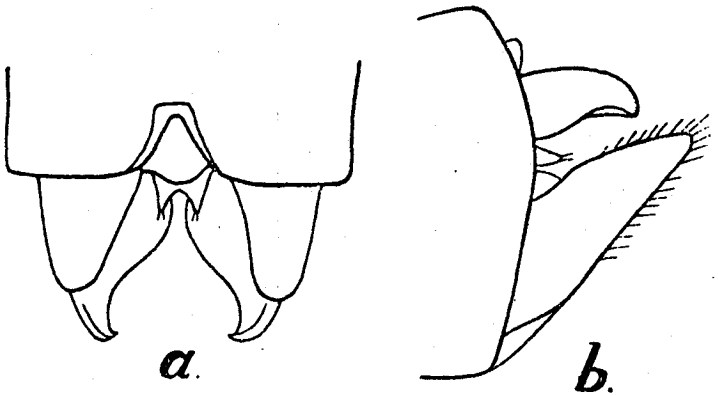

Fig. 6.—*Nesobasis flavilabris* Selys, appendages of male; *a*, dorsal view, *b*, lateral view (× 40).

all taken on the Waidoi River, during the months of May, Aug., Sept. and Oct., 1919, by Mr. Simmonds.

The species can be recognised by its very dark coloration, from which the pale yellow labrum stands out conspicuously. In most specimens the labrum is wholly yellow, but there are several in the collection in which there is a small blackish patch in the middle of the base of the labrum, always much smaller and less noticeable than that to be found on the labrum of the succeeding very closely allied species. The tip of the abdomen in the male, *i. e.* seg. 10 and the two pairs of appendages, is dark red in colour. The appendages of the male are shaped as shown in Text-fig. 6; superiors 0·4, inferiors 0·6 mm. long;

but there is some amount of variation in the size and shape of the peculiar small bifid process which can generally be seen projecting below and between the superior appendages. *Pterostigma* 0·6 mm., trapezoidal, the basal side very oblique, so that the anterior side is considerably shorter than the posterior. The female is generally not quite as dark as the male, and shows quite clearly a series of paler basal bands on segs. 3–8; when very mature, it becomes almost black like the male.

Types :—Several males and a female, in Godeffroy Museum, Hamburg.

This species is one of three very closely allied species of

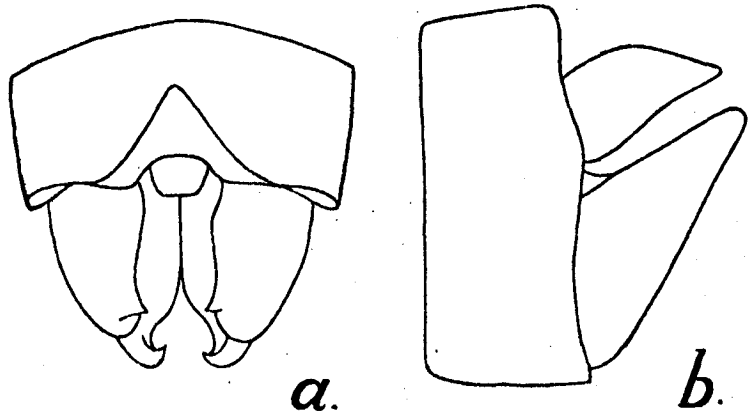

Fig. 7.—*Nesobasis corniculata* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 40).

very similar facies and coloration, in all of which the inferior appendages of the male are longer than the superiors, pointed and somewhat curved inwards.

7. Nesobasis corniculata n. sp.

(Text-fig. 7.)

♂. *Total length* 43, *abdomen* 36, *fore-wing* 24 mm.

Closely similar to the male of *N. flavilabris* Selys, with the same general form and black coloration, but differing from it as follows :—The *labrum* is yellowish, with a very distinct dark median patch basally, fuscous; this patch is considerably larger than the small basal patch which is found on the labrum of the variety of *N. flavilabris* mentioned above. Seg. 10 is dark brownish; the appendages bright red. The form of the *appendages* (Text-fig. 7) is

generally similar to those of *N. flavilabris*, but the superiors are longer, 0·5 mm., only about one-sixth or less shorter than the inferiors, and they carry on the inner margin, just before the apex, a very distinct cornicle or tooth projecting inwards transversely; there is also no bifid process, such as can usually be seen between and below the superior appendages of *N. flavilabris*. Viewed in profile, the superior appendage is broader, less nodding and more sharply pointed at the apex than in *N. flavilabris*. These differences are well seen by comparing Text-figs. 6 and 7. *Pterostigma* 0·7 mm., trapezoidal, anterior side less than posterior.

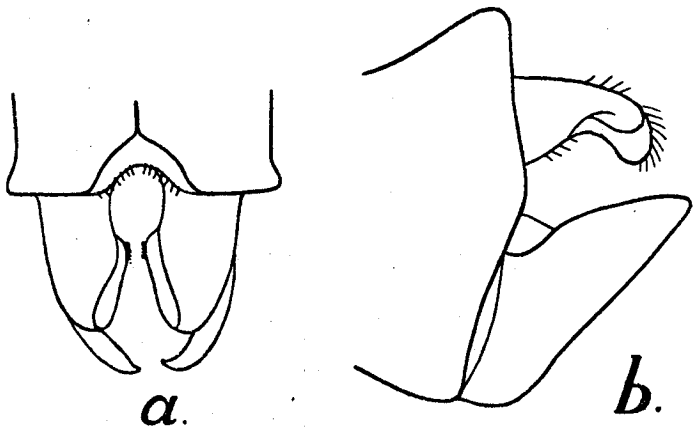

FIG. 8.—*Nesobasis simmondsi* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 30).

♀. *Total length* 44, *abdomen* 37, *fore-wing* 27·5 mm.

Closely resembles the female of *N. flavilabris*, from which it can only be distinguished with difficulty by the dark median patch on the labrum, the pale basal bands on segs. 3–6 broader and more clearly marked off, and the slightly longer appendages.

Types :—Holotype male and allotype female, in Cawthron Institute Collection, taken *in cop.*, Waidoi River, Fiji, Aug. 24th, 1919, by Mr. Simmonds. Also three paratype males, from same locality, May 18th and Aug. 31st, 1919, respectively.

8. **Nesobasis simmondsi** n. sp.

(Text-fig. 8.)

♂. *Total length* 46, *abdomen* 37, *fore-wing* 27 mm.

Though of somewhat larger size than the two preceding species,

this species shows a general close resemblance to them. The *abdomen* is dark brown, with pale basal rings on segs. 3–7. Seg. 10 and the appendages are a medium reddish brown in colour. The *labrum* and *anteclypeus* are both very dark brown, the *postclypeus* shining black. *Thorax* black, with brownish streaks irregularly placed on sides, and with the jet black breast surrounded with pale yellowish brown. *Legs* pale testaceous, with a dark line above on femora and a dark patch on knees. The species is, however, most easily recognised by the form of the *appendages* (Text-fig. 8). Seg. 10 is considerably enlarged, especially when viewed from the side, and carries a pair of very large inferior appendages, 0·8 mm. long, which, viewed from below, appear like a large forceps attached ventrally to the segment; these appendages are considerably longer than the superiors, which are only 0·6 mm. long, and are curved in apically much as in the two preceding species. The superiors are slightly hollowed out along the distal portion of their inner margin, and the same margin carries, about its middle, a short blackish projection or tubercle. The end of the tenth segment is raised up in the middle high above the superior appendages, and the incised median border carries a series of short bristles. *Pterostigma* 0·8 mm., rhombic, pale brown with darker lanceolate centre.

Type :—Holotype male, April 20th, 1919, and paratype male, Oct. 3rd, 1919, Waidoi River; taken by Mr. Simmonds; the former in Cawthron Institute Collection, the latter in British Museum Collections.

9. **Nesobasis comosa** n. sp.

(Text-fig. 9.)

♂. *Total length* 40, *abdomen* 32, *fore-wing* 24 mm.

Of the same general form as *N. flavilabris*, but with somewhat more slender abdomen. General colour dark slaty-black all over; *labrum* greenish black; *eyes* black above, green below; *legs* black, with a touch of reddish on the distal part of the hind tibiae; a touch of greyish pruinescence on sides of thorax, and more on the breast; superior *appendages* blackish, interiors reddish brown. The *frons* carries a series of long, slender, light brown hairs, which project forwards in a regular row, their tips reaching well beyond the level of the anterior end of the labrum. The superior and inferior *appendages* (Text-fig. 9) are of about the same length, 0·5 mm. long, the superiors very hairy, especially around their apices, the inferiors of the usual triangular form, with the apices turned inwards and

strongly pointed. Seg. 10 is only weakly incised medially. *Pterostigma* 0·7 mm., trapezoidal, anterior side longer than posterior.

♂ *Type*:—Holytype male, unique, Waidoi River, Aug. 24th, 1919, taken by Mr. Simmonds; in Cawthron Institute Collection.

10. Nesobasis nigrostigma Selys.

This species can be recognised by the *frons* and first three segments of the *antennae* being yellow, the *thorax* bronze above, with a yellow humeral line and the sides and breast yellow, the *abdomen* slender, of a bronze fuscous colour, brown on segs. 8–10, the legs yellowish, the *pterostigma* black, and the inferior *appendages* very short, only half as long as the superiors, which are pinched in at the tips.

♀. Unknown.

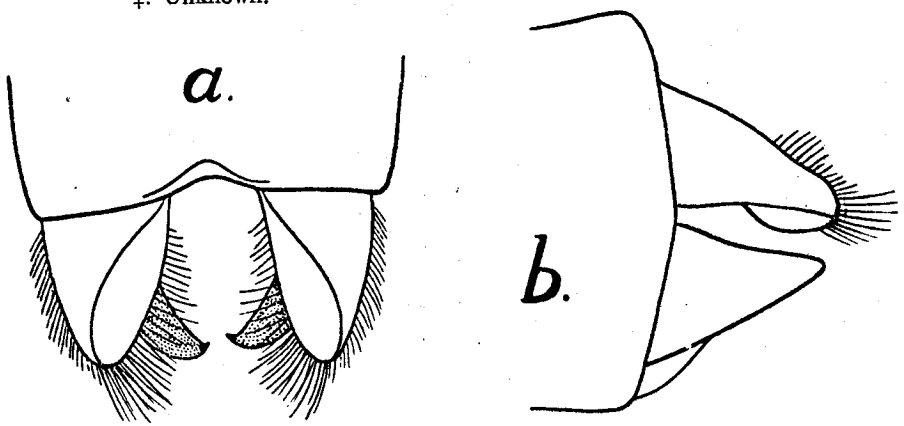

Fig. 9.—*Nesobasis comosa* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 40).

Type:—Holotype male, unique, in Godeffroy Museum, Hamburg. Not represented in the Simmonds Collection.

11. Nesobasis angulicollis n. sp.

(Text-figs. 10–12.)

♂. *Total length* 38, *abdomen* 31·5, *fore-wing* 22 mm.

Head:—*Eyes* brown above, green below. *Ocelli* semi-transparent brownish. *Antennae* brown. *Epicranium* black; *frons* with a transverse band of bright blue extending on either side on to the border of the eye. *Postclypeus* black; *anteclypeus* and *labrum* apparently blue, but somewhat darkened in the dead insect. *Labium* pale testaceous.

Thorax:—*Prothorax* with the pronotum strongly angulated postero-laterally, as shown in Text-fig. 10*c*, right side; bronze black and bright blue, the pattern being shown in the same Text-fig.; the black posterior mark on either side encroaches anteriorly on to the blue by a slender oblique pointed extension, directed forwards, so as to divide the blue anterior portion into three lobes, the middle of which is again divided mid-dorsally by a fine black line. *Synthorax* greenish black above, with a fine blue line along the mid-

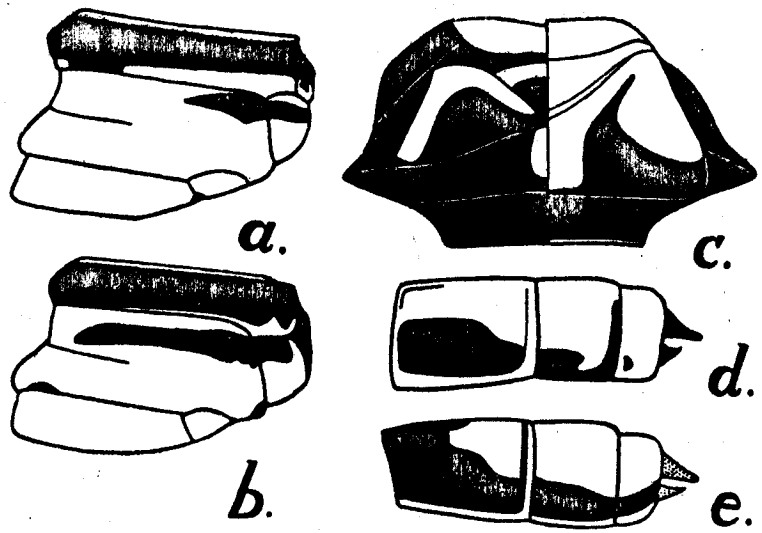

Fig. 10.—*a*, colour-pattern (blue and black) of thorax of male of *Nesobasis angulicollis* n. sp., lateral view. *b*, the same for male of *N. subhumeralis* n. sp. *c*, dorsal view of prothorax, the right half being that of the male of *N. angulicollis* n. sp., the left half that of the male of *N. subhumeralis* n. sp. *d*, lateral view of abdominal segs. 8–10 in *N. angulicollis* n. sp., male. *e*, same for *N. subhumeralis* n. sp., male (*c* × 34, all the rest × 12).

dorsal carina; the dark colour only reaches the humeral suture along the distal fourth of it, leaving a narrow blue band above the rest of the suture, as shown in Text-fig. 10*a*; sides almost entirely bright blue, there being a longitudinal black mark placed anteriorly just below the humeral suture, extending across the upper portion of the mesepisternum and backwards on to the mesepimeron, ending in a point before half-way; breast livid, slightly pruinose. *Legs*:—coxae, trochanters and underside of femora pale yellowish; upper side of femora and nearly whole of tibiae black; apical part of tibiae and whole of tarsi brownish.

Abdomen:—very slender, blackish above on segs. 3–7; segs. 1–2 and 8–10 bright blue above, this colour extending well down on the sides of seg. 8 distally, far down on the sides of seg. 9 altogether, and entirely around seg. 10 except for a small triangular basal spot of black low down on each side (Text-fig. 10*d*); sides and underside yellowish. *Appendages*:—Superiors 0·5 mm. long, wide apart, each consisting of a main lobe much hollowed out above on the inner side, and sending a basal prolongation inwards nearly parallel to the border of seg. 10; each prolongation ends inwardly in a broad tooth, the two teeth nearly meeting in the middle line, and leaving an oval gap between them, as shown in Text-fig. 11; viewed laterally, the superiors

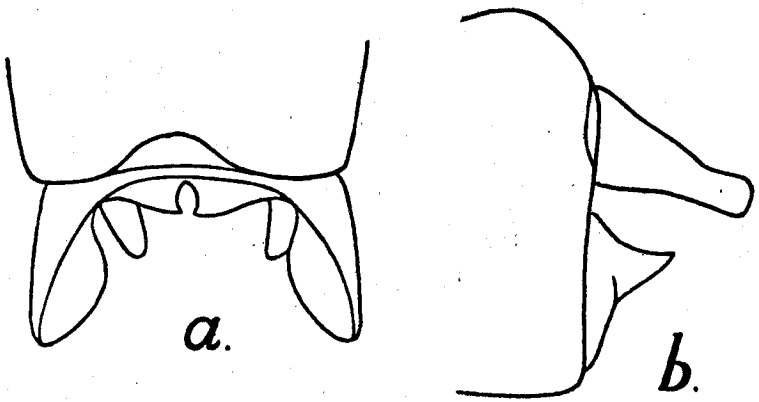

Fig. 11.—*Nesobasis angulicollis* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

appear somewhat truncated. Inferiors little more than half as long, broadly sub-triangular, the tips turned inwards and slightly upwards.

Wings:—*Pterostigma* 0·5 mm., narrowly rhomboidal, blackish with slightly paler edging, the whole enclosed by stout veins of jet-black colour; length slightly less than width, and covering barely one cellule. *Postnodals* 13. Origins of M_3 and Ms exceedingly close together, almost as close as in the New Guinea species *N. ciliata* Ris.

♀. *Total length* 34, *abdomen* 28, *fore-wing* 23 mm.

Somewhat similar to the male, but paler in colour; *labrum* dark olive green. *Prothorax* strongly angulated as in the male, but the blue and black pattern somewhat different owing to the black not dividing the blue so completely into three separate lobes (Text-fig. 12). *Legs* pale yellow, femora with a dark band above. *Abdomen*

mostly yellowish on sides and underside, dark bronze above except for most of seg. 9 and whole of seg. 10, which are blue; sides of segs. 1–2 also marked with blue. *Appendages* very short, subconical, dark; *ovipositor* yellowish, reaching well beyond end of appendages.

Types:—Holotype male and allotype female, in Cawthron Institute Collection, taken *in cop.*, Waidoi River, Aug. 26th, 1919, by Mr. Simmonds. Also two paratype males from same locality, dated Sept. 18th, 1919, and Oct. 4th, 1919, respectively.

This graceful and delicately built species is one of a series of four closely allied species which stand out very distinctly

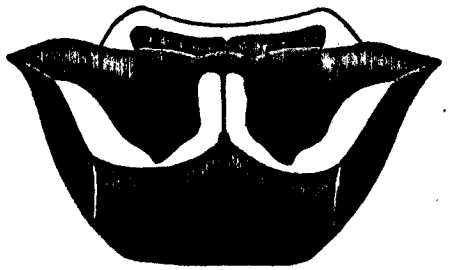

Fig. 12.—*Nesobasis angulicollis* n. sp., prothorax of female, dorsal view (× 34).

from the *flavilabris* group by their smaller size and slenderer build, and also by their blue and bronze-black coloration. The form of the appendages connects them at once back to *N. erythrops* Selys, which also has blue markings on the end of the abdomen, but is otherwise a somewhat more robust and very differently coloured species. The angulated prothorax in both sexes is a feature of this group, but is most marked in the present species.

12. Nesobasis subhumeralis n. sp.

(Text-figs. 10, 13.)

♂. *Total length* 36, *abdomen* 30, *fore-wing* 22 mm.

Very closely allied to *N. angulicollis* n. sp., from which it can only be distinguished by the following characters:—*Eyes* black above, green beneath; *labrum* blue edged with black. *Prothorax* not so strongly angulated postero-laterally as in *N. angulicollis*, and with much less blue on it, as shown in Text-fig 10*c*, left side. *Synthorax*

bronze black above, with a fine blue line along mid-dorsal carina, and the black reaching exactly to humeral suture on either side; sides bright blue, but with a long and well-developed black band running just below the humeral suture, so as to isolate a narrow blue band on the upper portion of the mesepimeron; this black band runs to within a short distance of the posterior end of the pleuron, and also extends forwards well on to the mesinfraepisternum (Text-fig. 10*b*). *Abdomen* blackish above, with blue on sides of segs. 1–2; seg. 8 black above basally and on sides, blue above distally; segs. 9–10 blue above and on upper part of sides. Text-fig. 10*d*, *e* shows the difference in the pattern of segs. 8–10 in this and the preceding species. *Appendages* very similar to those of the preceding species,

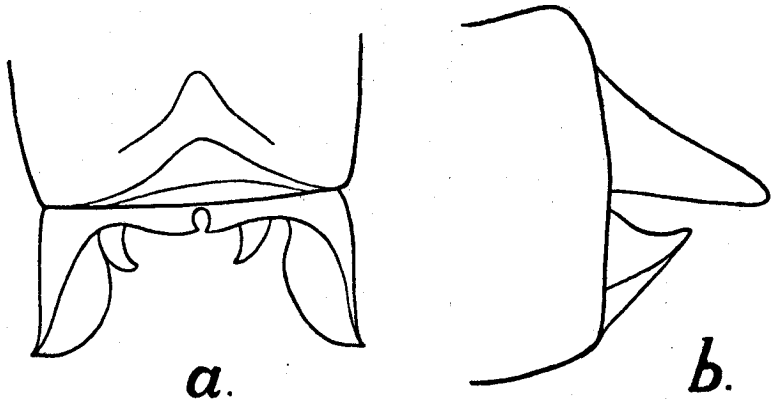

FIG. 13.—*Nesobasis subhumeralis* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

the superiors 0·5 mm. long, but more pointed apically, and with the points slightly turned outwards; seen in profile they are not so truncated; inferiors very broadly triangular, the tips turned well upwards and inwards. Both pairs of appendages are black in colour. Seg. 10 is perhaps slightly more incised medially than in the preceding species. (Text-fig. 13.) *Wings* very similar to those of the preceding species, but the *pterostigma* 0·6 mm., rhombic, exactly as long as broad, and covering just one cellule.

♀. Unknown.

Types:—Holotype male, Aug. 24th, 1919, and paratype male, Sept. 12th, 1919; both taken on the Waidoi River by Mr. Simmonds; the former in Cawthron Institute Collection, the latter in British Museum Collections.

13. Nesobasis selysi n. sp.

(Text-figs. 14, 15.)

♂. *Total length* 38, *abdomen* 32·5, *fore-wing* 21 mm.

Head rather small, barely 3 mm. wide. *Eyes* black above, green beneath. *Ocelli* semi-transparent brownish. *Antennae* black, shading to dark brown. *Epicranium*, *frons* and *clypeus* entirely black; *labrum* olive green, with numerous soft brownish hairs. *Labium* pale testaceous.

Thorax rather short and slender, less than 4 mm. long. *Prothorax* fairly small, angulated postero-laterally, but the angles not as prominent as in the two preceding species; colour metallic greenish black, the pronotum marked anteriorly with a somewhat trifoliate blue patch followed by a central blue patch more triangular

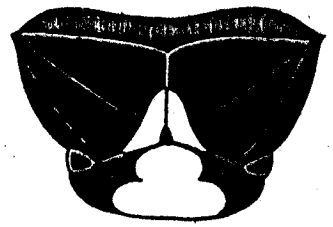

FIG. 14.—*Nesobasis selysi* n. sp., prothorax of male, dorsal view (× 34).

in shape, divided longitudinally by the black line of the dorsal carina, as shown in Text-fig. 14. *Synthorax* entirely black above, velvety, with a slightly greenish tinge in certain lights; sides also black, with two rich blue bands, one situated along the first lateral suture, beginning low down on the mesinfraepisternum, and reaching back about three-fourths the length of the pleuron; the other latero-ventral, running from behind the third coxa to the roots of the hind-wing; between these two bands there is a broad band of black, covering the second lateral suture; breast blackish, with dark grey pruinescence, the post-sternum pale testaceous. *Legs* mostly black; apices of the coxae, most of the trochanters and a spot at base of femora pale testaceous; distal part of tibiae and whole of tarsi brownish.

Abdomen:—very slender, black; seg. 1 with a blue spot on either side; underside yellowish brown. Segs. 9–10 are generally entirely black, but in some specimens each carries a narrow blue line around its distal border. *Appendages*:—Superiors short, only 0·3 mm. in

length, wide apart, diverging, apices fairly well rounded; between them there projects an obtusely triangular median lobe, as shown in Text-fig. 15. Inferiors very slightly shorter, with broad bases and narrow apices directed somewhat upwards and inwards. Seg. 10 very little incised medially.

Wings:—*Pterostigma* 0·5 mm., black, rhomboidal, covering one cellule. *Postnodals* 14–15. *Venation* black, the membrane slightly clouded with brownish in the adult male. Only one cross-vein (*i. e.* two cellules) between the origins of M_3 and Ms.

♂ Teneral:—In the very young male the thorax is bluish, or yellowish tinged with blue, on the sides, and there is no sign of the black lateral band; the legs also are pale testaceous all over. At

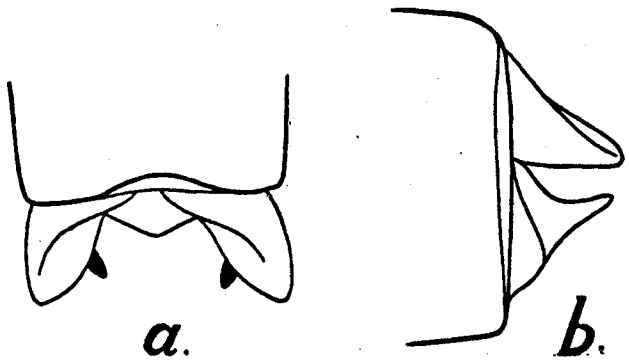

FIG. 15.—*Nesobasis selysi* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

a slightly later stage, the blue colour becomes bright on the thorax, but the black lateral band does not appear until the blue is already well established. The legs darken gradually. The amount of yellow on the underside of the abdomen is much greater in the teneral form than in the adult, and the spots on seg. 1 are yellowish at first. Probably the specimens showing fine blue apical lines on segs. 9–10 are not as mature as those in which these segments are entirely black.

♂ Aged:—In the aged male, the legs become almost entirely black, and the blue colour of the thorax deepens to a rich violet.

♀. *Total length* 37, *abdomen* 31, *fore-wing* 22·5 mm.

Differs from the male in the following points:—*Labrum* olive brownish, shading to yellowish along the margin. *Legs* testaceous yellowish. *Thorax* black above, with a fine blue line in the humeral suture; sides blue, without any band on the second lateral suture.

Abdomen with sides of seg. 1 almost entirely blue; a patch of bluish yellow on either side of seg. 2; underside of abdomen markedly brownish; sides of seg. 9 largely brownish also; general shape narrowly cylindrical, but not as slender as in the male. *Appendages* short, conical, brown. *Ovipositor* reaching to end of seg. 10 only, medium brown, with dark brown styles.

The teneral ♀ has the blue replaced by yellow.

Types:—Holotype male and allotype female, in Cawthron Institute Collection, taken *in cop.*, Waidoi River, Sept. 16th, 1922, by Mr. Simmonds. Also a series of nineteen males and seven females taken in the same locality during August to November, 1919, by Mr. Simmonds; this series includes several teneral forms of both sexes.

This species is closely related to the two preceding, but can be at once distinguished from them by the shorter appendages and the lack of conspicuous blue coloration at the end of the abdomen; also, the thorax is blacker, the broad black lateral band being quite distinctive for the species, except in the teneral forms.

14. **Nesobasis campioni** n. sp.

(Text-fig. 16.)

♂. *Total length* 36, *abdomen* 31, *fore-wing* 19 mm.

Head:—*Eyes* brown, orbits yellowish olive in front. *Ocelli* transparent brownish. *Antennae* dark brown. *Epicranium* and upper part of *frons* bronze black; rest of *frons* olive; *postclypeus* black; *anteclypeus* olive. *Labrum* blackish at base, shading to olive apically, with a touch of brown in the middle. *Genae* olive. *Labium* pale testaceous.

Thorax:—*Prothorax* black above, pale yellowish on sides; posterior lobe with rather blunt lateral angles. *Synthorax* bronze black above and on sides as far as first lateral suture; the humeral suture with a very slender brown line; sides blue, the second lateral suture with a touch of black near base of hind-wing; underside pale testaceous. *Legs* yellowish brown, with black hairs; femora broadly black above.

Abdomen entirely bronze black above, except for a little orange brown basally on seg. 1, a pair of small orange apical spots on seg. 2, and a basal ring of the same colour on seg. 3, interrupted by black mid-dorsally; sides and underside dull yellowish; seg. 10 very strongly hollowed out above. *Appendages*:—Superiors 0·5 mm.,

longer than seg. 10, subcornute and somewhat forcipate when viewed from above, and having a broad inner lobe occupying a little more than the middle third; seen in profile, they are somewhat clubbed; colour dull brown, shading to black at tips. Inferiors excessively short on a broad base; colour rich brown. (Text-fig. 16.)

Wings:—*Venation* brown at bases but soon becoming blackish; the wing calli and axillaries bright brown. *Pterostigma* 0·6 mm., rhombic, black, surmounting barely one cellule. *Postnodals* 12. M_2 arising 5 cellules distad from nodus, M_{1A} 2 cellules further distad.

♀. Unknown.

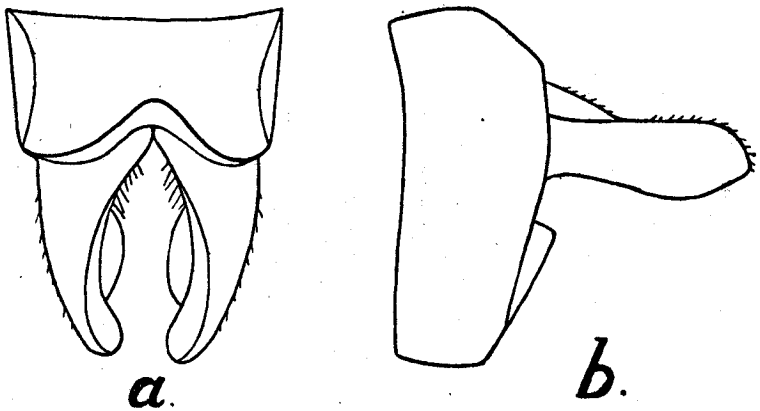

Fig. 16.—*Nesobasis campioni* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

Types:—Holotype male in Cawthron Institute Museum; also a single paratype male in British Museum Collection; both taken by Mr. Simmonds at Sigatoka, Viti Levu, Oct. 26th, 1922.

This species closely resembles *N. selysi* n. sp. at first sight, but can be at once distinguished from it by the sides of the synthorax being blue without any black bands, and by the shape of the appendages, which are of the same type as those of the much larger *N. longistyla* Selys.

15. Nesobasis aurantiaca n. sp.

(Text-fig. 17.)

♂. *Total length* 35, *abdomen* 28·5, *fore-wing* 18 mm.

Head:—*Eyes* dark brown, the orbits yellow in front. *Ocelli* transparent reddish brown. *Antennae* blackish, basal segment

orange. *Epicranium* and upper part of *frons* dark metallic green with small rectangular marks of reddish brown in front of and touching the median ocellus, similar marks in front of each antenna, and separate similar marks situated slightly mesad of each antenna; rest of *frons* orange; *postclypeus* black; *anteclypeus* and *labrum* orange; *genae* orange finely bordered with black in front. *Labium* dull yellowish.

Thorax:—*Prothorax* rich orange, the pronotum with two fine black points anteriorly, a fine mid-longitudinal black line, and a broader transverse black mark in front of the posterior lobe, which is moderately well angulated laterally. *Synthorax* rich metallic

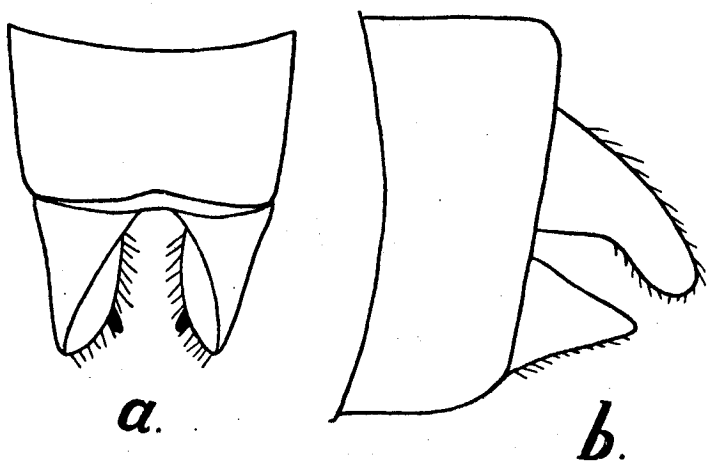

Fig. 17.—*Nesobasis aurantiaca* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

green above, with a triangular orange spot in front of the base of each fore-wing; sides and underside entirely dull orange except for a small blackish mark near base of each hind-wing. *Legs*:—coxae and hind femora dull orange, middle femora medium brown, fore femora dark brown; tibiae brownish; tarsi brown, shading to black distally on each segment; hairs black; claws black.

Abdomen:—Seg. 1 orange; seg. 2, orange with two basal black points and two larger apical rounded spots, united on each side by a fine longitudinal black line running very close to mid-dorsum; segs. 2–5 with an apical ring of black; segs. 3–8 dark metallic bronze green above, yellowish on sides and beneath; 3–6 with a narrow basal orange ring, interrupted mid-dorsally by black on 4–6. Segs. 9–10 blue above, yellow beneath. *Appendages*:—Superiors 0·3

mm., black, with brownish hairs; bases broad, fairly close together; shape subcornute, the inner portion strongly hollowed out; seen in profile, they are depressed, the apical half being strongly bent downwards. Inferiors 0·2 mm., broadly triangular in profile, the tips pointed and turned inwards. (Text-fig. 17.)

Wings hyaline with black *venation*. *Pterostigma* rhombic, 0·7 mm., dark brown, enclosed by black veins and surmounting one cellule. *Postnodals* 12–13. M_2 arising 6 cellules distad from nodus, M_{1+2} three cellules further on.

♀. Unknown.

Types:—Holotype male in Cawthron Institute Collection; also two paratype males, one in British Museum

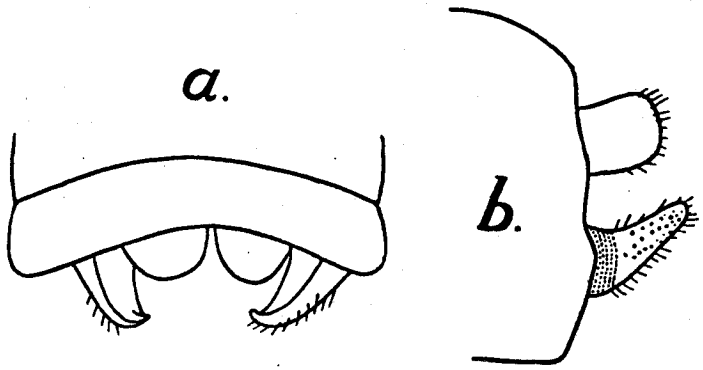

Fig. 18.—*Nesobasis brachycerca* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 56).

Collection and one in Department of Agriculture, Suva; all three specimens taken by Mr. Simmonds at Sigatoka, Viti Levu, on Oct. 25th, 1922.

This species appears to be closely related to *N. nigrostigma* Selys, from which it can be at once separated by the form of the appendages, by the angulated posterior lobe of the prothorax and by the smaller size and less number of postnodals.

16. **Nesobasis brachycerca** n. sp.

(Text-fig. 18).

♂. *Total length* 42, *abdomen* 35, *fore-wing* 23·5 mm.

Head entirely black, except *labium* and *orbits* beneath, which are yellowish.

Thorax:—*Prothorax* somewhat angulated postero-laterally, dark bronze green above, yellowish red on sides. *Synthorax* reddish on shoulders and sides, a broad band of dark bronze green situated dorsally; underside yellow. *Legs* yellow, with black spines.

Abdomen:—very slender, bronze black above, yellow below; seg. 9 mostly reddish above; seg. 10 entirely reddish. *Appendages* excessively short; superiors only 0·2 mm. long, dark, sub-cylindrical, bluntly rounded at tips; inferiors somewhat longer, reddish, subcornute, tips turned upwards and inwards. (Text-fig. 18.)

Wings:—*Pterostigma* 0·7 mm., rhomboidal, distal side somewhat convex; covering somewhat less than one cellule; blackish, circled with brown and enclosed with black veins. *Postnodals* 12–13. Only one cross-vein between origins of M_3 and Ms.

Type:—Holotype male, unique, taken at Bua, Fiji, on Sept. 9th, 1922, by Mr. Simmonds; in Cawthron Institute Collection.

17. **Nesobasis heteroneura** n. sp.

(Text-fig. 19.)

♂. *Total length* 34, *abdomen* 27, *fore-wing* 19 mm.

Head:—black, except *labrum*, which is bluish green, and a transverse anterior band on the frons, touching the eyes on either side, green; *eyes* brown above, green beneath; *labium* brownish.

Thorax:—*Prothorax* barely angulated postero-laterally, black above, blue on sides. *Synthorax* dark greenish black above, with a fine blue line in the humeral suture; sides blue, with a small black mark posteriorly in the second lateral suture; the blue extends upwards far enough to leave only a narrow dark band below the humeral suture. *Legs* black, except coxae, which are dull greyish.

Abdomen:—moderately slender and short, of about the build seen in *Ischnura* or *Pseudagrion*; general colour dark greenish black above. Segs. 1–2 broadly blue on sides. Segs. 9–10 bright blue above and on sides. Underside yellowish. *Appendages*:—Superiors 0·5 mm., blackish bordered with brown; seen from above they are subconical, with well-rounded apices; in profile they are rather broad, the apices well rounded; the apices carry strong hairs. Inferiors of same length, broadly sub-triangular, the tips with strongly hooked points turned inwards towards one another, only slightly hairy. (Text-fig. 19.)

Wings:—This species differs from all others of the genus in having the origins of M_3 and Ms placed further apart than usual, the distance between the two being either equal to, or a little more than,

the descending basal piece of Ms. *Pterostigma* 0·7 mm., rhomboidal, a little longer than wide, black circled with brown and enclosed by black veins; covering about one cellule. *Postnodals* 13–15; usually two, or even three, cross-veins between the origins of M_2 and M_{1A}, very exceptionally only one.

♀. *Total length* 31, *abdomen* 24, *fore-wing* 21 mm.

Differs from the male in being shorter and stouter, with the blue of the thorax replaced by yellowish; *abdomen* bronze black above, yellow on sides; no blue on segs. 1–2; segs. 9–10 either entirely bronze black above, or sometimes with a small blue blotch on 10 and distal part of 9. *Pterostigma* brown between black veins. *Legs* yellowish, shading to brown on tibiae and tarsi.

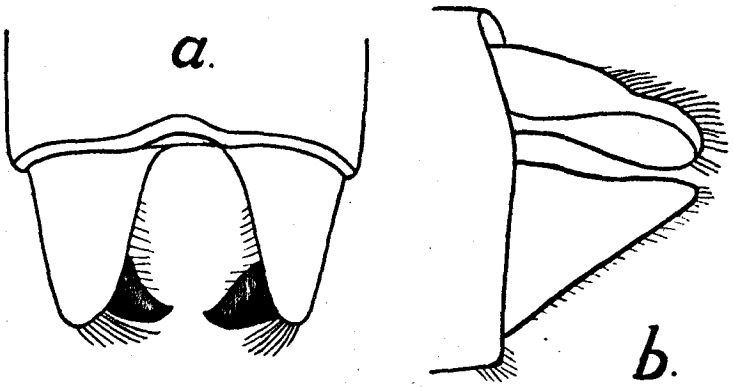

Fig. 19.—*Nesobasis heteroneura* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

Teneral forms of both sexes are pale yellow on those parts which become blue in the adult, while the colour of those parts which remain yellow in the adult is paler yellow. Aged females are almost entirely dull blackish, with grey pruinescence on sides of thorax.

Types:—Holotype male and allotype female, taken *in cop.*, Waidoi River, Aug. 29th, 1919, by Mr. Simmonds; in Cawthron Institute Collection. Also the following series of paratypes, taken during Aug. to Oct., 1919, in the same locality:—eleven pairs taken *in cop.*, seventeen adult single males, twelve adult single females, one teneral yellow male and three teneral yellow females.

This is at once the commonest and the least typical member of the genus *Nesobasis*. In general build and coloration it resembles, apart from its venation, a species

of *Ischnura*, such as the Australian *I. heterosticta* Burm. The more than usually wide separation of the points of origin of M_3 and Ms brings it close to the genus *Austroagrion*, from which it is at once separated by its larger size and lack of postocular spots, and also by the greater length of M_{1A} and Cu_2. In dichotomous keys of the genera of the group *Pseudagrion*, it would run down to the African genus *Argiagrion*, though almost certainly not truly related in any way to that genus, which contains the largest species in the whole series. I have thought it best to leave it at the end of the genus *Nesobasis*, while pointing out its obvious differences from the other members of that genus.

Genus Agriocnemis Selys.

Two species of this interesting little genus occur in the Fiji Islands. Both belong to the group in which the inferior appendages are much reduced, being represented merely by small tubercles carrying a minute black point. They may be distinguished as follows:—

Male with segs. 8–10 and apex of seg. 7 bright red; postocular spots of moderate size, sub-triangular . . . *A. vitiensis* n. sp.
Male with abdomen entirely black above, except for pale basal lines on segs. 3–6; postocular spots very small, broadly oval. *A. exsudans* Selys.

18. **Agriocnemis exsudans** Selys.

(Text-fig. 20.)

The type-locality for this species is New Caledonia, but I have also recorded it from the New Hebrides. Three specimens in the Simmonds Collection appear to be males of this species. The female has not previously been described.

The male has the *eyes* dark brown above, green beneath; the *epicranium* black, with a broad transverse band of white pulverulence extending between the forward part of the eyes, and including the bases of the antennae and the front margin of the median ocellus; *postocular spots* very small, broadly oval, dull orange; the *clypeus* is very dark purple, the *labrum* a deep metallic violet. *Thorax* blackish above, covered with whitish pulverulence; sides shading to greyish brown; breast more or less covered with white pulverulence. *Legs* with blackish femora and brownish-red tibiae and

tarsi; white pulverulence present ventrally on the femora in some cases. The *abdomen* is bronze black above, with pale yellowish basal lines around segs. 3–6; underside yellowish; appendages dull red. The shape of the *appendages* is shown in Text-fig. 20, though it should be noted that the abdomen was slightly turned so as to show a little more than half of the dorsal portion; *i. e.* the superior appendage is strictly not so far removed from the apparent mid-dorsal line of the last segment as the figure would indicate.

The New Hebrides specimens have a large dark patch on the superior appendages, which is absent in the Fijian specimens. De Selys does not state definitely what colour the superior appendages are in the New Caledonian types, though one might assume that they were reddish, from his reference to the resemblance

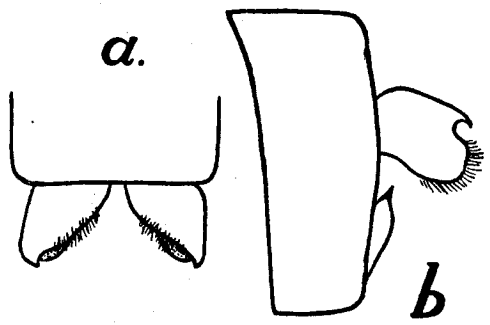

Fig. 20.—*Agriocnemis exsudans* Selys, appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

between this species and *A. pygmaea* Ramb., which has them reddish also. *Postnodals* 5–7, usually 7. *Pterostigma* 0·5 mm., brownish in fore-wing, black in hind-wing, covering somewhat less than one cellule.

Two females which appear to belong to this species, though not taken *in cop.*, differ from the males in the absence of the white pulverulence, the shiny black labrum, the large triangular post-ocular spots of a yellowish colour, the thorax bronze black above, bronze yellow on sides, shading below to livid, the legs dull greyish brown with blackish bands above on femora, and black apices to the segments of the tarsi. The abdomen is coloured much as in the male, but is slightly shorter and stouter, more cylindrical. Appendages very short, conical, reddish. Sutures between segs. 7–10, pale yellowish. Pterostigma pale brownish on all four wings.

Types:—Holotype males from New Caledonia in Coll.

Selys, Brussels Museum. Allotype female and one paratype female, Waidoi River, Fiji; taken by Mr. Simmonds, the former on June 2nd, 1919, the latter on Sept. 7th, 1919; three males taken from same locality on Sept. 8th, Sept. 17th and Oct. 2nd, respectively. Allotype female in Cawthron Institute Collection, paratype female in British Museum Collections; one male in each of these Collections and one in Dominion Museum, Wellington, N.Z.

19. **Agriocnemis vitiensis** n. sp.

(Text-fig. 21.)

This species belongs to the same group as the above, having appendages closely similar to it in form and also the labrum of a rich metallic violet.

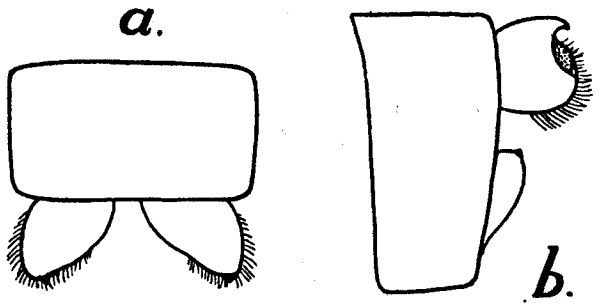

Fig. 21.—*Agriocnemis vitiensis* n. sp., appendages of male; *a*, dorsal view, *b*, lateral view (× 45).

♂. *Total length* 26·5, *abdomen* 21, *fore-wing* 12 mm.

Head:—*Eyes* purplish black above, green beneath. *Postocular spots* of moderate size, sub-triangular, green. *Epicranium, frons* and *postclypeus* black; *anteclypeus* and *cheeks* pale yellow; *labrum* rich metallic violet; *labium* and *orbits* beneath pale testaceous.

Thorax:—*Prothorax* bronze black above, pale greenish on sides. *Synthorax* bronze black above, with a yellow humeral line, sides pale greenish. *Legs* dull brownish, darker at apices of femora, and with the apices of the tarsal segments black.

Abdomen:—Segs. 1–6 bronze black above, yellow below, with a fine yellow line around bases of 2–6; seg. 7 mostly bronze black above, but apical sixth red, the red colour extending further basad on the sides; segs. 8–10 and appendages entirely bright red.

Appendages as shown in Text-fig. 21, the superiors somewhat broader than those of the preceding species both in dorsal and lateral view, the inferiors represented only by a reddish tubercle carrying a fine black point.

Wings:—*Pterostigma* 0·6 mm., trapezoidal, anterior side longer than posterior, covering considerably less than a single cellule; colour pale brown with darker centre, the whole enclosed in black venation, and that of hind-wing darker than that of fore-wing. *Postnodals* 7.

♀. *Total length* 26·5, *abdomen* 21, *fore-wing* 14·5 mm.

Very different in coloration from the male.

Head:—*Eyes* black above, green beneath. *Postocular spots* very large, sub-triangular, reddish orange. *Epicranium* black; on the *frons*, a narrow transverse line of red, divided medially by a black longitudinal bar, and spreading out laterally very widely on the anterior part of the orbit. *Postclypeus* blackish; *anteclypeus* and *labrum* brown. *Labium* pale testaceous.

Thorax:—*Prothorax* red above, with a black T-mark, the cross-bar of which is fine and clear, but the stem duller and more diffuse, spreading out in the form of a triangle with its base on the posterior margin of the segment. *Synthorax* with broad dorsal band of bronze black, followed by an antehumeral band of deep yellow on either side; sides red above, shading to greenish yellow below, with slight tinges of red. *Legs* pale yellowish brown.

Abdomen:—red above, yellow beneath; last third of seg. 6, the whole of segs. 7–8, most of seg. 9 and a basal patch on seg. 10, blackish. *Appendages* exceedingly short, reddish. *Ovipositor* yellowish.

Wings:—*Pterostigma* 0·7 mm., trapezoidal, with the posterior side considerably shorter than the anterior, covering less than one cellule; colour pale brown between black veins on all four wings. *Postnodals* 7–9.

Types:—Holotype male (Oct. 10th, 1919) and allotype female (Aug. 31st, 1919), taken by Mr. Simmonds on Waidoi Plantation; in Cawthron Institute Collection; also a series of five paratype males and two paratype females, one pair being in British Museum Collections, the other in the Dominion Museum, Wellington, N.Z.

A single aged male in this collection has the thorax well covered with greyish pruinescence while keeping the red colour of the end of the abdomen quite vividly.

Genus ISCHNURA Charp.

20. **Ischnura heterosticta** Gurm.

One male and one female taken by Mr. Simmonds at Sigatoka, Viti Levu, Oct. 30th, 1922. Mr. Campion has also noted this species in material sent for determination from Fiji by Mr. Robert Veitch in 1916.

21. **Ischnura aurora** Br.

Three males and two females of this beautiful little species are included in the collection, all from Waidoi Plantation, Aug. and Sept., 1919.

Sub-order *ANISOPTERA*.

Family AESCHNIDAE.

Genus ANACIAESCHNA Selys.

22. **Anaciaeschna jaspidea** (Burm.).

A single male of this species was taken at Waidoi Plantation by Mr. Simmonds on June 2nd, 1919.

Family LIBELLULIDAE.

Sub-family *CORDULIINAE*.

Genus SYNTHEMIS Selys.

23. **Synthemis macrostigma macrostigma** Selys.

Not represented in the Simmonds Collection. The type female, in the Hagen Collection, was taken in Fiji; the type male is labelled "Oceania," and may also have come from Fiji. The species is abundant on mountain swamps in Eastern Australia, where it forms a distinct subspecies, *S. macrostigma orientalis* Till. It also occurs in Western Australia, at lower elevations, as a third subspecies, *S. macrostigma occidentalis* Till. The genus is confined to Australia, Tasmania, Papua, New Caledonia and Fiji.

Genus PROCORDULIA Martin.

24. **Procordulia irregularis** Martin.

This fine and rare species is represented by a single male and three females in the Simmonds Collection. These

were taken on the mountains around Waidoi by Mr. Simmonds, the male on Aug. 6th, 1919, the females on Aug. 31st, Sept. 6th and Sept. 12th, respectively. The male and one female are in the Cawthron Collection, a second female in the British Museum Collections, and the third in the Dominion Museum, Wellington.

Genus HEMICORDULIA Selys.

25. **Hemicordulia tau** Selys.

Not represented in the Simmonds Collection, but recorded by Selys in Bull. Acad. Belg. (2), xxxi, (1871), p. 257, from "îles Fidji (Coll. Hagen)."

Sub-family *LIBELLULINAE*.

Genus HYPOTHEMIS Karsch.

This monotypic genus is placed by Ris as the most primitive representative of the sub-family; the single species is confined to Fiji.

26. **Hypothemis hageni** Karsch.

Not represented in the Simmonds Collection. It appears to be very rare, but is probably easily overlooked owing to its small size.

Genus ORTHETRUM Newm.

27. **Orthetrum sabina** (Drury).

A single female of this widely spread species was taken by Mr. Simmonds on Waidoi Plantation, June 19th, 1919. It is in the Dominion Museum, Wellington. Also recorded by Ris from Fiji (Monograph. Libellulinen, p. 224).

Genus LATHRECISTA Kirby.

28. **Lathrecista asiatica asiatica** Fabr.

Not represented in the Simmonds Collection. This species is widely distributed from Borneo and Celebes right through to Fiji and Tonga. Ris records a male from Fiji in the British Museum Collections (Monograph. Libellulinen, p. 130).

Genus DIPLACODES Kirby.

29. **Diplacodes bipunctata** (Brauer).

A single male of this common species is included in the Simmonds Collection by coloured drawing only, undated. Mr. Simmonds wrote that it was a sketch of an individual of a "rather common" species. There was no difficulty in recognising the species from the drawing. There is also a male of this species in the Selys Collection in the Brussels Museum, and one male and two females in the Hamburg Museum, as recorded by Ris (Monograph. Libellulinen, p. 471). It is abundant throughout Australia, and not uncommon in the North Island of New Zealand, though much rarer in the South Island.

30. **Diplacodes trivialis** (Ramb.).

Not represented in the Simmonds Collection. A common species ranging from India through the Malay Archipelago to Papua and Queensland. It is recorded from Fiji by Ris (Monograph. Libellulinen, p. 469), and Mr. Herbert Campion informs me that he has also seen material of this species from Fiji.

Genus PANTALA Hagen.

31. **Pantala flavescens** (Fabr.).

Not included in the Simmonds Collection, but recorded from Fiji by Ris, specimens from these islands being present in the Hamburg Museum. It appears to be present on all the tropical and subtropical islands of the Pacific.

Genus TRAMEA Hagen.

32. **Tramea limbata** (Desjardins).

Not present in the Simmonds Collection. Recorded from Fiji under the name *T. transmarina* Brauer.

Genus RHYOTHEMIS Hagen.

33. **Rhyothemis phyllis dispar** Brauer.

This is a very distinct subspecies of the widely spread *Rh. phyllis* (Sulz.), and is confined to the Fiji Islands. It can be at once recognised by the dark band along the whole of the costa, spreading out widely around the apex, in both sexes; the wings of the female are more heavily

marked than those of the male. The Simmonds Collection contains a male taken by Mr. Simmonds on Aug. 22nd, 1919, and a female on Sept. 15th, 1919, both on Waidoi Plantation. The male is in the British Museum Collections, the female in the Dominion Museum, Wellington.

Besides the above specimens, Mr. Simmonds sent two rather young larvae in spirits, taken from the Waidoi River. These have rather broad, horizontally placed caudal gills, and appear to belong either to the genus *Argiolestes* or possibly to its close relative *Trineuragrion*. We may therefore hope that representatives of the ancient Megapodagrioninae may one day be taken in Fiji, affording yet further proof of its being an outlying portion of the ancient Australian land-mass.

An Analysis of the Zoo-Geographical Elements composing the Odonate Fauna of the Fijian Islands.

Our knowledge of the Odonate fauna of Fiji appears to be now sufficiently complete to allow of an analysis being made of the various elements which enter into its composition from the zoo-geographical standpoint. We may ask, is the fauna a purely insular one, or is it an offshoot from a true continental fauna; and, if the latter, then to what zoo-geographical region does it belong? In order to answer these questions, we must first analyse the components of the fauna with a view to discovering which are the endemic forms, and also which forms belong to the various divisions of the zoo-geographical regions concerned. The results obtained are as follows:—

A. Endemic Genera:—In this division we must include *Nesobasis* with fifteen species and *Hypothemis* with one species only. *Nesobasis* is reckoned as endemic in spite of the existence of a single Papuan species (*N. ciliata* Ris) placed by Dr. Ris in this genus, since it seems clear that the Papuan species stands well apart from the Fijian group of species, and ought perhaps to be placed in a distinct genus.

Nesobasis is allied on the one hand to *Teinobasis* Kby. and on the other to *Pseudagrion* Selys. It is clearly more archaic than either of these genera; than *Teinobasis*, because of the less petiolate wings and the unreduced tarsal claws; than *Pseudagrion*, because of the absence of post-ocular spots, the simple prothorax of the female, and the less specialised form of the appendages. It may well represent fairly closely the original type from which the groups Teinobasini and Pseudagrionini have arisen, and is certainly to be reckoned an archaic genus compared with most of the genera found within these two tribes.

Hypothemis is a monotypic genus placed by Ris at the very base of the sub-family Libellulinae. It is closely allied to *Tetrathemis*, a genus of wide distribution from West Africa through India and the Malay Archipelago to Australia, and also appears to lie close to the base of the original stem of the Eucorduliine group of the sub-family Corduliinae, as represented by *Cordulephya* at the present day.

We see then that these two endemic genera have several points in common. They are both distinctly archaic as compared with their nearest allied genera; they both stand within their own tribes at a point very close to the original of another tribe (*Nesobasis* in Pseudagrionini close to origin of Teinobasini, *Hypothemis* in Tetrathemini close to the origin of Cordulephyini); and they both belong to old complexes of forms having a distribution from Africa through India and Malaya to the Australian Region (*e. g.* the dominant genera *Pseudagrion* on the one hand and *Tetrathemis* on the other). Such a distribution suggests an origin in late Gondwana-land, and could be readily understood if we were to accept Wegener's theory of the drift of continental masses. In any case, it indicates an origin not later than Jurassic for these two complexes, and would point to the fact that, about this time, the Fijian Islands formed a portion of the old continental mass bordering the Pacific Ocean on the west, whose original shore is now sundered from Australia by the great Tasman Sea. That this was so, we know already from evidence furnished by the geology of the Islands themselves.

B. Endemic Species of Non-endemic Genera:—Under this heading we group the four species *Austrolestes vitiensis* n. sp., *Pseudagrion pacificum* n. sp., *Agriocnemis vitiensis* n. sp. and *Procordulia irregularis* Martin (the record given by Martin for this last species from "Celebes" is surely an error). Two of these belong to genera (*Pseudagrion*, *Agriocnemis*) having a closely similar distribution to those given in Section A, while *Procordulia* ranges from

Australia and New Zealand through to Java, and *Austrolestes* is an Australian complex within the almost world-wide group of forms comprised in the great genus *Lestes*.

All the above must be reckoned as later additions to the Fijian fauna than those given in Section A. They probably reached the Islands about the period when they were being severed for the last time from their continental connection. The Zygoptera represented in this Section B may well have made little headway after their arrival owing to the fact that *Nesobasis* had already become dominant, and the new arrivals were not strong enough to compete with it to any extent.

C. Endemic Subspecies of Non-endemic Species :— Under this heading we have *Synthemis macrostigma macrostigma* Selys and *Rhyothemis phyllis dispar* Br. The former is much more archaic than the latter, and must be reckoned as a much older element in the Fijian fauna, seeing that, at the present time, the species *S. macrostigma* Selys is represented by three widely separated subspecies, in Western Australia, Eastern Australia and Fiji, respectively. Being a weak-flying species confined to mountain swamps, it must have reached Fiji before the old continental connection was finally severed. *Rhyothemis phyllis dispar*, on the other hand, may well be quite a late addition to the fauna, as it belongs to a highly evolved and dominant genus having a wide distribution from Africa to Australia, and is a subspecies of a species, *Rh. phyllis* Kby., which shows a continuous distribution right through from India to Australia and Fiji.

D. Non-endemic Species : — There remain twelve species belonging to ten genera which may be included under this heading. They can be classified as follows :—

D 1. Austro-Malayan Species :—*Ischnura aurora* Br., *Anaciaeschna jaspidea* (Burm.), *Lathrecista asiatica* (Fabr.), *Orthetrum sabina* (Drury), *Diplacodes trivialis* (Ramb.) and *Tramea limbata* (Desj.). Of these, the oldest of the Libellulinae is undoubtedly *Lathrecista asiatica*, which is the only one in which two distinct subspecies have been evolved during the passage from Papua to Australia on the one hand, and from Papua to Fiji and Tonga on the other. As it is a species which haunts the deep jungle and flies but little, it probably reached Fiji while there was still a fairly easy way of entry by means of a continuous land-bridge or close chains of islands. The same may be true

of *I. aurora* Br., which is a very weak flier, but might conceivably be carried by wind storms. The other four species are almost certainly late arrivals which could readily pass over considerable stretches of water from island to island.

D 2. Australian Species :—*Ischnura heterosticta* Burm., *Diplacodes bipunctata* (Br.) and *Hemicordulia tau* Selys. These may be considered as late additions to the fauna, all being very common in Eastern Australia. *Hemicordulia tau* has been observed migrating, and has probably colonised Fiji directly from Australia. The other two probably spread more slowly from island to island after the continental connection was finally broken.

D 3.—New Caledonian Species :—*Agriocnemis exsudans* Selys is found only in New Caledonia and Fiji, and appears to be a fairly old species which perhaps developed as common to the two groups of islands when they were much more closely connected than they are at the present time. The fact that the other Fijian species of this genus is endemic would tend to support this view.

D 4. Circumtropical Species :—A single species, the ubiquitous *Pantala flavescens* (Fabr.). It is a fine flier with a strong migratory instinct, and is evidently a very late addition to the fauna of the Islands. This species is still in process of colonizing the eastern coastline of Australia, where it has already reached a point somewhat south of Sydney.

The above results may be exhibited numerically as follows :—

ANALYSIS OF THE GENERA OF ODONATA IN FIJI.

Distribution.	Number.	Percentage of whole fauna.
Endemic	2	12·5
Non-endemic :—	14	87·5
Australian	2	12·5
Austro-Malayan	4	25·0
Late Gondwanan (= *Afrieo-Malayan*)	6	37·5
Circum-tropical	2	12·5
Total	16	100·0

ANALYSIS OF THE SPECIES OF ODONATA IN FIJI.

Distribution.	Number.	Percentage of whole fauna.
Endemic species	20	60·6
Additional endemic subspecies	2	6·1
Non-endemic :—	11	33·3
New Caledonian	1	3·0
Australian	3	9·1
Austro-Malayan	6	18·2
Circum-tropical	1	3·0
Total	33	100·0

XVIII. *The Genitalia in* Sabatinca *and Allied Genera (Lepidoptera Homoneura), with some Observations on the same Structures in the Mecoptera.*

By Alfred Philpott, Assistant Entomologist, Cawthron Institute, Nelson, N.Z.

[Read October 17th, 1923.]

(With Twenty-one Text-figures.)

By common consent the Micropterygidae are regarded as the most primitive of the Lepidoptera, and *Sabatinca* is generally admitted to be the most archaic genus of the family. What chiefly strikes the student of the genitalia in this genus is the apparent absence of the eighth sternite and the simplicity of the parts as compared with those of the higher Lepidoptera. The complicated tegumen and uncus, the intricate valvae with their varied armature and the puzzling parts of the anal segment are replaced by much simpler structures. But, unfortunately, this simplicity

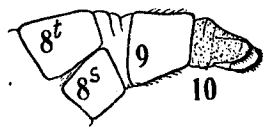

Fig. 1.—*Sabatinca aurella* Huds. ♀.

appears to be the result rather of specialisation than the retention of primitive characters, consequently, less information than might be expected is to be gained from the investigation. Still, such an investigation is full of interest and certain conclusions, though perhaps of only minor value, emerge therefrom.

A detailed account of the parts now follows; but it has been thought advisable to refrain from any attempt to give a minute description of the structures in writing, and to trust more to figures to convey the correct impression to the reader. The genus *Sabatinca* will first be dealt with, and I have been fortunate enough to have at my dis-