

XVIII A LIST OF THE DRAGONFLIES RECORDED FROM THE INDIAN EMPIRE WITH SPECIAL REFERENCE TO THE COLLECTION OF THE INDIAN MUSEUM

PART III.—THE GENUS *LESTES* AND ITS ALLIES.

By F. F. LAIDLAW, M.A.

(With Plate V).

The present part concludes my account of Indian dragonflies belonging to the sub-order Zygoptera. I have deliberately headed it "the genus *Lestes* and its allies," because at the present moment the precise status of the several sections into which the Zygoptera naturally fall is a matter of debate; and it is better on the whole to leave the exact rank to which this very distinct group is entitled, an open question.

As the number of species is not great, and as the group is fairly homogeneous, I have dealt with the systematic arrangement of the species on a somewhat different plan to that adopted in my previous papers. With regard to geographical distribution I have noted records under the heading of the several species.

I need scarcely point out that the Indian Lestine fauna is of exceptional interest, and is in all probability very imperfectly known. I list here some seventeen or eighteen recorded species, of which the museum collection contains twelve.

The following table will, I hope, be of assistance in identifying the Indian species of the group. At the same time it will serve to express my views on the classification of its members. Putting on one side *Megalestes*, which stands apart from the rest, I am inclined to the opinion that the genera proposed for certain aberrant species have probably not more than sub-generic value.

I regard the character afforded by the similarity or dissimilarity of the quadrangle of fore and hinder wings as of the first importance, following of course de Selys' main sub-division of the genus. Tillyard's genus *Austrolestes* is evidently nearly equivalent to Selys' "Deuxième section," but it should be noted that it can scarcely be separated on venational grounds from *Sympycna*. The only feature separating at least some of the Australian Lestines (*L. cingulata* Selys, e.g.) is the position of *Ac* at level of Ax_1 ; whereas in all the Indian forms of de Selys' second section (but not in *Sympycna*

paedisca Eversm.) *Ac* lies about half-way between level of Ax_1 and Ax_2 .

But the position of *Ac* is variable in the first section of the genus, though not so far as I know in Indian species. Thus in *L. unguiculata*, Hagen from N. America it occupies precisely the same level as in *L. cingulata*, Selys. And therefore I am in some doubt as to the advisability of using this character in defining a genus, and as a matter of fact Tillyard does not so employ it.

As to the termination of the specific names. The generic name *Lestes* is a term not necessarily I think of the masculine gender. The specific name of the type-species *L. sponsa* Hansem, is definitely feminine; therefore I believe it correct to follow de Selys in employing for the specific names the feminine termination.

For venation I employ Tillyard's modification of the Comstock-Needham nomenclature; Ax_1 and Ax_2 for antenodal nerves, *Ms*. for the sector usually denoted by *Rs*.

I. Petiolation of wing ceasing *before* the level of *Ac*. No supplementary sectors between *Ms* and *M₃*. *Ac* distinctly nearer the level of Ax_1 than of Ax_2 .

MEGALESTES.

II. Petiolation of wing commences *at* level of *Ac*. Supplementary sectors developed between *Ms* and *M₃*.

(α) *M₂* rises 8-8½ cells distal to nodus on forewing. *Ac* lies nearer level of Ax_1 than of Ax_2 . Wings coloured (in males of Indian species).

OROLESTES.

(β) *M₂* rises not more than 6 cells distal to nodus in forewing.

A. Quadrangle of fore and hinder wings equal. Inner side of quadrangle of hinder wing at least two thirds length of upper side,

* *Ms* only slightly angled, in its distal half. Pterostigma at least twice as long as broad.

i. Synthorax without metallic markings.

Colour russet-brown, pterostigma unicoloured, yellow or brown

Lestes umbrina,
Selys.

Thorax green, pterostigma dark, gray brown, its outer quarter paler

Lestes thoracica,
sp. n.

Thorax brown, pterostigma longitudinally bicoloured (yellow and black), margin of wing sharply decurved beyond the pterostigma ...

Lestes nodalis,
Selys.

ii. Synthorax with metallic green bands.

Bands very narrow; no black on head, pterostigma brown, three times as long as broad

Lestes viridula,
Ramb.

Bands broader, about one-third width of mesepisternite, or more; securiform above. Head with black markings. Pterostigma about two and a half times as long as broad, black in adult.

Lestes elata,
Selys.

Bands trilobed, about one-third width of mesepisternite. Head with black markings. Pterostigma about two and a half times as long as broad, black in adult

Lestes praemorsa,
Selys.

[In the last two species the colouring of the adult is largely black. *L. decipiens*, Kirby, a form I have not seen, appears to me to be a local race of *L. praemorsa*].

iii. Synthorax almost entirely bronze-green above. Pterostigma transversely bicoloured, basal half brown, distal half whitish. Palaearctic species from Kashmir

Lestes barbara
(Fabr.)

Dorsum of synthorax with dorsal and humeral bands of yellowish colour. Pterostigma yellow. Very large species. Hinder-wing ♂ 38 mm.

Lestes orientalis,
Hagen.

** *Pterostigma not twice as long as broad.*

Colouring grayish-white, marked with black, or dark cinnamon brown

Lestes sp. ♂
(?=*Platylestes platystyla*
(Ramb.))

Ms angled ("sous-nodal anguleux").

"*Pterostigma scarcely two and a half times as long as it is broad.*"

Colouring grayish yellow, almost without markings, segments 8-9 of abdomen black. ♀ Annal appendages ovoid, very depressed, as long as the last segment.

Platylestes platystyla
(Ramb.)

B. Quadrangle of hinder-wing distinctly longer than that of fore-wing; its *inner* side not more than one-third the length of its *upper* side; its lower outer angle very acute.

a. Spines of legs relatively short, those of the posterior tibia scarcely as long as tarsal claws of the same legs.

Colouring blue and bronze-black.

Ratio of greatest breadth of wing to length 1 : 6.

Lestes cyanea,
Selys.

b. Spines of tibiae relatively long, those of the posterior pair longer than tarsal claws of same leg.

* Colouring blue and bronze-black.

Ratio of greatest breadth of wing to length about 1 : 5; upper surface of head black (noirâtre)

Lestes gracilis,
Selys.

Upper surface of head bronze.

Lestes divisa,
Selys.

** Colouring brown marked with green-bronze or bronze-black.

† Posterior prothoracic margin simple.

Pterostigma not inflated, its outer margin not oblique, only twice as long as broad; uncoloured

Lestes? bilineata,
Selys.

Pterostigma scarcely inflated, its outer margin not oblique, three times as long as broad

Lestes sp. ♀.

†† Posterior prothoracic margin trilobed.

Pterostigma a little inflated, its outer margin oblique. *Ac.* nearly at level of *Ax*₁...

Lestes (Symphyena)
paedisca
(Eversm.)

1. *Megalestes major*, Selys.[†]¹

<i>Megalestes major</i> ,	Kirby, <i>Cat. Odonata</i> , p. 159.
„ „	M'Lachlan, <i>Ann. Mag. Nat. Hist.</i> (6) LXVI, p. 20 (1895).
„ „	Martin, <i>Mission Pavie</i> (sep.), p. 18.
„ „	Ris, <i>Supplementa Entomologica</i> , No. 5, June 1916. p. 11.

This species, the only representative of its genus, was for long supposed to be confined to the southern slopes of the Himalayan range (see M'Lachlan, loc. cit.) Martin, however, has recorded it from Tonkin and Ris from Formosa.

The Museum collection contains 2 ♀ ♀ in spirit from Pashok, 5,000 ft., Darjiling District, 14.vi.16, scarcely adult ($\frac{3458}{HI}$); and one ♂ from Bhim Tal, Kumaon, 19—22. ix. 06 ($\frac{9787}{51}$) (N.A.). I have seen also 3 ♂ ♂ from the Indian Forestry Zool. Col. from Binsar, Kumaon, and one ♂ from Gopaldhara, Darjiling district, collected by Mr. H. Stevens.

The immature females have a large yellow mark occupying the middle of the dorsum of the prothorax; and on the synthorax there is a yellow stripe along each side of the mid-dorsal carina, and another along the line of the first lateral suture: whilst from the second lateral suture ventralwards the thorax is yellowish white. The dimensions of the female specimens are:

Length of hinder-wing 37.5 mm., of abdomen 44 mm.

2. *Orolestes selysi*, M'Lachlan.

<i>Orolestes selysi</i> ,	M'Lachlan, <i>Ann. Mag. Nat. Hist.</i> (6) XVI, pp. 21-23 (1895).
„ „	Martin, <i>Mission Pavie</i> (sep.), p. 18.

I have not seen an example of this rare and splendid Lestine. I quote from M'Lachlan's account, "wings for the greater part opaque blackish in the male, petiolated up to the first basal post-costal nervule, which latter is placed nearer the level of the second than of the first antenodal nervule. Nodal sector commencing 8½ cellules after the nodus in anterior wings (7-7½ after in the posterior); ultra nodal sector commencing 3-4 cells after the nodal. None of the sectors distinctly broken (angulose) excepting the inferior of the triangle at its apex (the ultra nodal and short sectors very slightly broken); one supplementary sector (and rudiment of another) interposed between nodal sector and median; pterostigma very large, dilated, more than four times as long as broad, surmounting 5-6 cellules. Quadri-lateral broad, lower side twice the length of the inner, the outer angle somewhat acute.

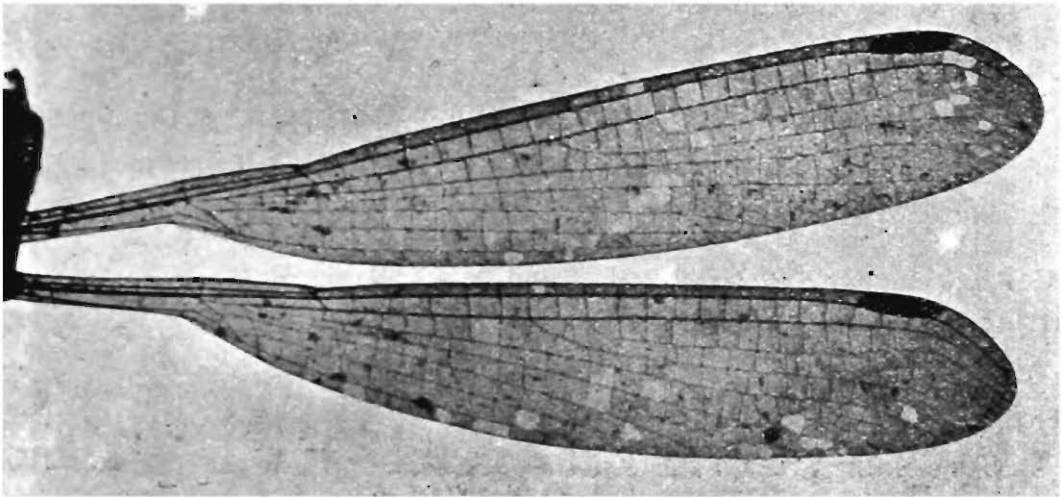
Abdomen slender, spines of legs moderate.

Head black above—prothorax olivaceous green.—Thorax above bronzy green, not metallic, somewhat paler (yellowish?) on

¹ Species so marked are in the Indian Museum, Calcutta.

“ either side of the dorsal crest ; sides of thorax pale olivaceous
 “ green.—The olivaceous colour of the sides of the thorax is
 “ continued broadly on the sides of the first and second abdominal
 “ segments, and narrowly along the sides of the third to the fifth
 “ and part of the sixth segments ; abdomen above with a large spot
 “ occupying most of the first segment bronzy green, and the
 “ second wholly of this colour ; from the third to the tenth
 “ bronze black, but there is a long bluish space on the third and
 “ fourth, which are black only at base and apex. Legs black ;
 “ the femora brownish beneath.

“ ♂ Superior appendages black, quite one-half longer than the
 “ tenth segment, slender, forcipate, the tips regularly incurved,
 “ finely denticulate externally in the apical half ; internally a
 “ basal tooth, the usual dilatation commences in an obtuse and
 “ ends below the apex in a large triangular tooth, inferior appen-



TEXT-FIG. 1.—Venation *Lestes*? sp. from Borneo (Coll. Sarawak Mus.).

“ dages scarcely one-fourth length of superior. Length of abdomen
 “ 57 mm., of hind-wing 36-39 mm.”

I am enabled by the kindness of Messrs. H. and F. E. Campion to give a figure of a Bornean *Lestine*, undescribed I believe ; a male in bad condition. This specimen agrees in venation with MacLachlan's account of *Orolestes selysi* very closely as may be seen by an examination of text-figure 1. The only differences are : (i) the absence of opaque colouring, and (ii) the shape of the quadrangle. MacLachlan's definition of the genus gives, “ lower side twice the length of *inner*.” (The italics here are mine.)

Not having seen an authentic specimen of *Orolestes* I cannot speak with certainty on the matter, but I think it possible that for *inner* we should read *upper*. In that case the Bornean specimen would, except for wing-colour, fall into the definition of the genus *Orolestes*. In any case it seems to me that we may regard the species as intermediate between the true *Lestes* and *Orolestes*.

The markedly rectangular character of the venation should be noted. Like *Megalestes* this Himalayan form, with an allied species, has been recorded by Martin (*loc. cit.*) from Tonkin.

3. *Lestes umbrina*, Selys † (?).

(Pl. V, fig. 1).

Lestes umbrina, Selys, "Odonates de Birmanie." *Ann. Mus. Cw. Genova. X* (XXX), p. 497-498 (1890-91).

1 ♀ (Head, thorax and wings only). Cutch, W. India
(*F. Stoliczka*) $6\frac{3}{20}^20$; Labelled by Selys "*Lestes umbrina*.
Selys, Cutch. ♀ "

1 ♂ Allahabad (*A. D. Imms*);—1907, $6\frac{4}{20}^2$.

1 ♂ 1 ♀ Nagpur, C.P. (dry specimens), 1,000 ft., 10-v-15
(*E. D'Abreu*).

4 ♂ ♂ 2 ♀ ♀ Nagpur, C.P. (in spirit), N.C.M., 10-v-95
(*E. D'Abreu*).

1 (♂?) imperfect. Waltair, Madras Presidency., 23-iv-10
(*S. W. Kemp*) $6\frac{5}{20}^3$.

1 ♂ Allahabad (*A. D. Imms*).

Recorded by de Selys also from Hainan. I have identified the specimens listed above as *L. umbrina*, Selys with some misgivings. The ♀ specimen in the collection named by de Selys himself has largely influenced me in so doing; but unfortunately the specimen is very imperfect. I would point out, however, that there is a considerable resemblance between these specimens and the description of the species *L. concinna*, Selys (*Bull. Acad. Belg. (2)* xiii, p. 321; 1862), a resemblance to which de Selys has not called attention in his account of *L. umbrina*. Further, there are specimens in the British Museum of a *Lestes* apparently identical with the examples before me, collected by Everett in the Philippines, which have been labelled *L. concinna* by Kirby. So that it seems to me at least on the evidence available that the two names may be synonyms. On the other hand Selys' measurements of the hind-wing of his *L. concinna* show discrepancies, possibly due to a misprint. He gives the length of the hind-wing ♂ 28-31 mm., of the ♀ 19-22 mm.; and states that the colour of the pterostigma in the adult male is black, paler at the side and end. The specimen described was from Batavia. All the Indian Museum specimens have the pterostigma yellowish-brown except a very adult and imperfect specimen (? sex) from Waltair in which it is dark brown.

Unfortunately the accounts of the two species given by Selys are neither of them at all detailed.

The following description is based on spirit specimens from Nagpur, C.P.:—♂ *Head*: Under surfaces, bases of mandibles, and genae yellowish-white; the rest of the head and the eyes sandy yellow. In dried specimens the eyes have a dark brown colour.

Prothorax and *synthorax* almost uniformly sandy yellow, distinctly paler on the ventral surfaces, and in the most mature

specimens there is a distinct darkening of the mesepisternite near the mid-dorsal carina, where the colouring is of a more olive hue (this is more obvious in old pinned specimens than in spirit material).

Legs yellowish-white, with black spines and tarsal claws. The first pair of femora and tibiae have each a fine black externo-lateral line, of which only a trace is visible on the second pair of femora, none on the third pair.

Abdomen: Segments 1-8 sandy yellow, a slightly olive tinge dorsally, paler beneath. Except for the first segment, which is rather paler than the rest, the mid-dorsal line of each of these segments is marked with a very fine blackish line, and the basal and apical margins of each segment are also very narrowly marked with dark brown. On each segment from 2 to 7 the apex for a length of about a millimetre is a little paler than the rest, and lacks the olive shade; this paler area is separated from the remainder of the segment by a pair of minute, transverse, black dots lying on either side of the mid-dorsal carina, but not touching it. On segment 8 the mid-dorsal line is widened, and the sub-apical spots can scarcely be distinguished; 9-10 show progressive paling of colour distally, the apex of 10 and the anal appendages being of a creamy white colour. These segments are each marked with a fairly broad, black line dorsally.

Anal appendages: Upper part longer than segment 10 of abdomen, regularly incurved apically, with four or five fine black external denticles. Inwardly each carries a fairly stout spur, followed by a rounded shelf-like projection, lower pair barely one-half length of upper pair, triangular. The upper pair are a little darkened on the apices (see pl. V, fig. 1). The veins of the *wings* are brown in both sexes.

4. *Lestes nodalis*, Selys. †

(Pl. V, fig. 2).

Lestes nodalis, Selys, "Odonates de Birmanie." *Ann. Mus. Civ. Genova* X (XXX), pp. 496-497 (1890-91).

1 ♂ (Head, thorax and parts of wings only). Assam-Bhutan Frontier. "Deshroi, River and jungle" (*S. W. Kemp*) 25-xii-10.
 $\frac{64.33}{20}$.

In addition to the points noted by Selys as serving to characterize this species, the black nodal point and the longitudinally bicoloured pterostigma, the sharp deflexion of the wing margin beyond the pterostigma is worth noting.

I am able to supply a figure of the anal appendages of the male (missing in the present specimen) from an example in the British Museum from Assam. De Selys (*loc. cit.*) has recorded a specimen from Yunnan.

5. *Lestes thoracica*¹, sp. n. †

(Pl. V, fig. 3).

♂ 1 ♀ (type and allotype). Agra, United Provinces of Agra and Oudh (*E. J. Hankin*) 1916 (from bottles labelled 7 and 9).

Type ♂ and allotype ♀ to be returned to the Indian Museum. Dr. Hankin remarks that the male has a green thorax, and slightly green eyes; whilst the female has the thorax sage-green and eyes blue.

In the preserved specimen the green colouring has faded to a dull gray-brown.

Both sexes have the pterostigma dark grayish-brown, with its outermost quarter grayish-white. The dark area has also a fine lighter border. The veins of the wings are dark brown.

♂ Length of abdomen 30+1 mm., of hind-wing 20 mm.

Head: Upper lip and genae dull yellowish-brown (probably green in life), the rest of the anterior and upper surface black, save for a small yellow triangle enclosing the ocelli.

Posterior surfaces pale yellowish-white.

Prothorax: Upper surface jet black, lower surfaces yellowish-white.

Synthorax: Entirely gray-brown (green, non-metallic during life), save that the mid-dorsal carina is black, as are also the alar sinuses. The ventral surface is paler than the dorsal.

Abdomen: Segments 1, 2 pale yellow, at the sides and underneath; marked with a bronze-black band above. Segments 3-7 bluish-white underneath, each with a longitudinal, bronze-black band occupying the whole length of the segment dorsally. Segments 8, 9, 10 entirely bronze, the last two slightly black, pulverulent.

Anal appendages (Pl. V, fig. 3): Upper pair half as long again as the last segment, white in colour with black apices, which overlap each other. Each appendage has an inner basal tooth at about one-third of its total length, followed by a rounded projection, which carries fine black denticulations.

Legs white with black bands on the anterior surfaces of the femora and tibiae, tarsi black.

♀ Length of abdomen 28 mm., of hinder-wing 20 mm.

Head: Upper surface yellowish brown (probably sage-green in life) with small black markings on either side of the ocelli.

Prothorax: Yellowish-brown (when alive sage-green).

Synthorax: Sage-green above, paler at the sides and below, without a black line on the mid-dorsal carina.

Abdomen: Segments 1-7 with upper surface covered by bronze-black band, the colouring of this band is not very intense. Seg-

¹ I have lately received specimens of *L. thoracica* from Lake Chilka; and a long series of *L. nodalis* from Lower Burma.

ments 1 and 2 are pale yellow at the sides underneath; whilst 3-7 have the same parts greenish-white. Segment 7 has indications of a black median dorsal line, and 2-7 each have a fine pair of transversely placed black spots on either side of the mid-dorsal line, about one millimetre proximal to the apex of the segment. On 8, 9 and 10 the dorsal colouring becomes paler fading almost to white on segment 10, but each of these segments has a well-marked longitudinal black line above. Anal appendages white.

Legs as in the male.

This species is closely allied to *Lestes umbrina*, Selys, both in the general wing structure, and in the colour pattern of the female, as well as by the structure of the anal appendages of the male.

6. *Lestes viridula*, Ramb. †

(Pl. V, fig. 4).

Lestes viridulus, Kirby, *Cat. Odonata*, p. 163.

1 ♂ For. Zool. Coll. Gondumri, Bhandara, C. P., 1-xii-12 (*A. D. Imms*), "in jungle."

1 ♀ (imperfect). Mowai, Bara Banki, United Prov., 2-x-10 (*M. M. Khan*) $\frac{6488}{20}$.

The species is characterized by the *narrow* green band on either side of the mid-dorsal carina of the synthorax, and by the angular 'elbow' of the anal appendage of the male (Pl. V, fig. 4),

7. *Lestes elata*, Selys. †

(Pl. V, fig. 5 and text-fig. 2).

Lestes elatus, Kirby, *Cat. Odonata*, p. 162.

" " *id. Proc. Zool. Soc. Lond.* 1891, p. 203.

" " *id. Journ. Linn. Soc. Zool.* XXIV, p. 565 (1893).

1 ♀ Barkul, Orissa, 100 ft. 1-3—viii-14, *F.H.G.* $\frac{8223}{20}$.

1 ♂ ad. 1 ♀ juv. Bangalore, Mysore, ca. 3000 ft., 4-6-x-16, *N.A.*

1 ♂ 3 ♀ ♀ immature, 2 larvae, Bangalore, Mysore, ca. 3,000 ft. 4-6-x-16. *N.A.*

"Adults from edge of small ditch, larvae from ditch; no other species seen in vicinity."

Recorded from Ceylon (Kirby) and Tranquebar, Madras Presidency (Selys). Apparently widely distributed in peninsular India.

I have been able to examine Kirby's specimens in the British Museum. They agree closely with those now before me. The variation of which Kirby speaks (*loc. cit.* 93) is evidently a mat-



TEXT-FIG. 2.—Thoracic colour pattern of *L. elata*, Selys ♀, Bangalore.

ter of age, and perhaps of sex; the females that I have seen are all very similar, as are the young males, whose thoracic colouring is identical with that of the females. The adult male, as in the species *L. praemorsa*, Selys, develops much black colouring.

The shape of the metallic-green bands of the thorax, which are, as Kirby remarks, securiform behind, are characteristic of the species, whilst the deeply angled margin of segment 10 also distinguishes it from *L. praemorsa* (see text-fig. 2 and Pl. V, fig. 5).

Since the above was written, I have received a young male of this species from Karachi, kindly sent me by Major F. C. Fraser.

8. *Lestes decipiens*, Kirby.

Lestes decipiens, Kirby, *Journ. Linn. Soc. Zool.* XXIV, pp. 565-566 (1893).

I could not find examples of this species in the British Museum. It is evidently very closely allied to *L. praemorsa*, Selys, and may be a local race. The British Museum has several examples of the latter species from Ceylon.

9. *Lestes praemorsa*, Selys. †

(Pl. V, fig. 6 and text-fig. 3).

Lestes praemorsus, Kirby, *Cat. Odonata*, p. 162.

" " Selys, *Odonates de Birmanie*.

" " Krüger, *Stettin Entomol. Zeit.* 1898, p. 130.

" " Laidlaw, *Proc. Zool. Soc. Lond.* 1902, p. 382.

1 ♂ ad. Sibsagar (S. E. Peal) $\frac{6327}{20}$ (labelled by de Selys),

1 ♀ imperfect, Sibsagar, N.E. Assam (S.E. Peal) $\frac{6328}{20}$ (labelled by de Selys).

2 ♂♂ 1 ♀ Sitong, ca. 4000 ft., near Mangphu, Darjiling district (S. Kemp) 6-vii-18. $\frac{1800}{42}$.

This species is I think closely allied to *L. elata*, Selys. Both of them agree in that the adult males undergo melanotic development, and in both the anal appendages are much alike.



TEXT-FIG. 3.—Thoracic colour pattern of *L. praemorsa*, Selys ♀ Darjiling district, 4,000 ft.

L. praemorsa, however, appears on our present knowledge to have a much wider range than its relative; and when better known I have no doubt that it will be possible to distinguish local races for it.

I have been able to examine specimens at the British Museum from the Celebes and Ceylon. Those from the former locality are at once distinguishable from

the N. Indian examples by the difference in the thoracic pattern, which seems constant. The British Museum examples from Celebes seem to be distinct from the form for which de Selys pro-

posed the name *quercifolia*, but this form is also represented in the same collection. The thoracic pattern in the Sitong specimens, which are in better preservation than those from Sibsagar, is distinctly serrate. In an example from Ceylon the pattern is more irregular, this applies also to specimens from the Malay Peninsula (Skeat expedition), whilst in the British Museum material from the Celebes it is decidedly reduced.

10. *Lestes barbara* (Fabr.). †

Lestes barbarus, Kirby, *Cat. Odonata*, p. 162.

„ „ Calvert, *Proc. Acad. Nat. Sci. Philadelphia*, 1898, p. 147.

1 ♂ Jhelum Valley, 5,200 ft., Kashmir, N. W. Himalayas,
6-x-16 (H. T. Pease), $\frac{4318}{11}$.

A widely ranging Palaearctic species.

11. *Lestes orientalis*, Selys.

Lestes orientalis, Kirby, *Cat. Odonata*, p. 163.

„ „ *id.*, *Fourn. Linn. Soc. Zool.* XXIV, p. 566.

This fine species, equalling the largest members of the group in size, appears to be especially characteristic of Ceylon and S. India. I have not seen an example.

12. *Lestes* sp. (?=*Platylestes platystyla* (Ramb.)). †

(Pl. V, fig. 7 and text-figs. 4, 5).

1 ♂ "Found in collapsed condition on stairs of Museum building, Calcutta," 13-xi-17.

The type of *Platylestes platystyla* (Ramb.) is a unique female specimen described by de Selys. It is also the genotype.

The Museum specimen agrees fairly well in the important character of the short, squarish pterostigma with the genotype, save that in the male the pterostigma is distinctly less than twice as long as broad (the generic definition, based of course on a female, states that the pterostigma is *a peine deux fois et demie aussi long que large*)¹. Further in general the dimensions agree fairly well:—

Platylestes platystyla ♀ abd. 33 mm., hind-wing 23 mm.

Museum specimen ♂ abd. 32 + 1.5 mm., hind-wing 21 mm.

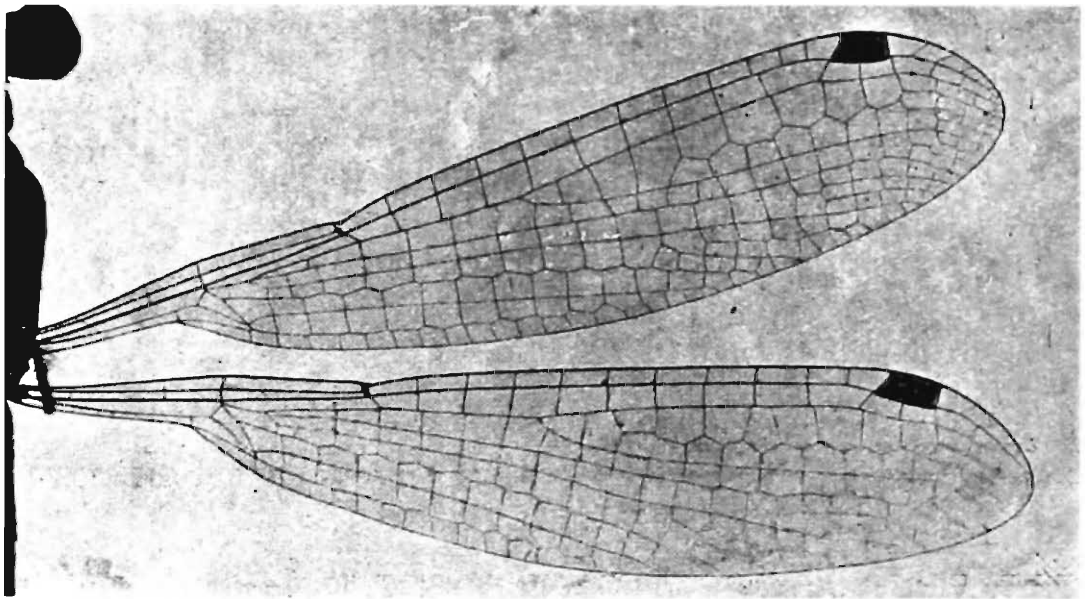
Lastly the colouring is not dissimilar though the male has black spots on the thorax not present in the type, and in general the male is not very unlike a *Platycnemis* in colouring and in the shape of the pterostigma.

This comparison with the type is made by de Selys. In the generic definition, however, he emphasises the point that the sub-nodal sector (*Ms*) is angulated, evidently in contrast with the non-

¹ I think Selys must have meant one and a half times.

angulated character of the same sector noted in his definition of *Sympycna* where it is said "le sous-nodal non anguleux ou à peine ondulé;" and of *Lestes* concerning which he makes the same remark.

Now an examination of the venation of the male specimen in question shows that the sub-nodal section (*Ms*) can scarcely be sharply contrasted with that of species of *Lestes* in that respect. Hence if the male be really conspecific with the type female the strongest character distinguishing the genus is annulled; the shape of the pterostigma alone is I think scarcely to be reckoned a generic character even though backed by certain sexual characters. Hence I prefer to leave the question of the identity of this fine specimen open, and hope that as it occurs in the neighbourhood of Calcutta examples of both sexes may soon be available for examination. I am, however, of the opinion that it is really the male of



TEXT-FIG. 4.—Venation of *Lestes* sp. (= ? ♂ *Platylestes platystyla* (Ramb.) from Calcutta.

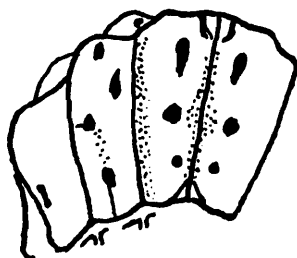
Platylestes platystyla. The following is a short account of the specimen:—

Wing petiolated to *Ac*, which lies about midway between level of *Ax*₁ and *Ax*₂. Pterostigma short, its inner margin more oblique than its outer, not twice as long as broad, a little inflated at the middle of its length, black, its outer and inner margins paler; covering two cells, and with a well-marked brace vein. Quadrangles of fore and hinder-wings similar, inner side nearly equal in length to upper. *Ms* becoming somewhat angled from the level of a point midway between nodus and pterostigma (scarcely more so than in other species of *Lestes*).

Head: Upper lip and eyes olive-green; the rest of the head a light grayish-yellow, with three small black spots on the post-clypeus, and black marks at the base of the antennae and immediately in front of the anterior ocellus.

Prothorax grayish white below.

Synthorax of the same colour, becoming milky white on the sides and below. On either side of the mid-dorsal carina lies a row of three small black spots, and on the side of the synthorax between the humeral and the second lateral sutures there are some four irregularly placed black spots; in addition a band of colour darker than the ground colour is found along the mid-dorsal carina, and a similar band lies in front of the humeral suture.



TEXT-FIG. 5.—Thoracic colour-pattern of *Lestes* sp. ♂ from Calcutta.

Legs gray-white. The articulations, cilia and a line along the posterior sides of the femurs black.

Abdomen olive gray, passing on the hinder segments gradually to a warm dark cinnamon brown. Segment 2 has an anterior and posterior pair of very small, black spots on either of the mid-dorsal carina.

Segments 2-6 have an apical narrow black ring, 3-6 have also a pale basal ring incomplete dorsally, and a second pale ring, likewise incomplete above, near the distal end of the segment. Between this second ring and the black apical ring there lies a pair of minute black spots, one on either side of the mid-dorsal carina.

Segment 7 has a basal pale ring and deepens gradually in colour to its apex, which has a narrow black ring; 8-10 are progressively darker in colour, each has, about at its middle, on either side of the dorsal carina, a fine white spot, and each is marked with a black apical ring.

Anal appendages: Upper pair nearly as long as segment 8. Basal fourth velvety black, the rest of their length milky white. Gently and regularly curving inwards to meet at their apices. On the inner side, at the end of the first third of their length, is a blunt projection, and at the end of the second third is a sharply pointed tooth directed backwards and inwards. The apex is bluntly rounded. Lower pair more than half the length of upper pair, meeting each other apically where they are upturned; rather spatulate. Each carries at its base on the inner side a somewhat tubercular projection extending for over one-third of its length.

It is evident that the anal appendages of this species differ strongly from other Indian species referred to the first Selysian section of the genus. This supports my belief that the specimen belong to a distinct sub-genus.

13. *Platylestes platystyla* (Ramb.).

Platylestes platystylus, Kirby, *Cat. Odonata*, p. 164.

See also remarks by de Selys in his paper "Odonates de Birmanie." *Ann. Mus. Civ. Genova*. X (XXX), p. 499 (1890-91),

14. *Lestes gracilis*, Selys.

- Lestes gracilis*, Kirby, *Cat. Odonata*, p. 163.
 " " *id.*, *Proc. Zool. Soc. Lond.*, 1891, p. 206.
 " " *id.*, *Fourn. Linn. Soc. Zool.*, XXIV, p. 566.
 " " Ris, *Supplementa Entomol.*, No. 5, 1916, pl. i, fig. 4.

Dr. Ris has described (*loc. cit.*) three races of this species, viz. *L. gracilis birmanus*, Selys, described by de Selys very briefly in his *Odonates de Birmanie* under the heading of *L. divisa* (p. 495) and recorded by Ris also from Madura in S. India; secondly *L. gracilis gracilis*, Selys, from Ceylon, and lastly *L. gracilis peregrinus*, Ris, from Japan. He gives figures of the venation of the species. The anal appendages bear a fairly close general resemblance to those of *L. cyanea*, Selys.

15. *Lestes divisa*, Selys.

- Lestes divisus*, Kirby, *Cat. Odonata*, p. 163.
 " " *id.*, *Fourn. Linn. Soc., Zool.*, XXIV, p. 566.
Nec Lestes divisa, Selys, *Ann. Mus. Civ. Genova* X (XXX), p. 495 (1890-91), (*fide* Ris).

Not in the Museum collection. I have not seen an example of this or of the preceding species.

16. *Lestes cyanea*, Selys. †

(Pl. V, fig. 8 and text-figs. 6, 7).

Lestes cyaneus, Kirby, *Cat. Odonata*, p. 163.

- A. 5 ♂ ♂ 8 ♀ ♀ Kufri to Phagu, 8,000-9,000 ft., Simla Hills, 18-v-16, $\frac{2883}{HI}$
 1 ♀ Same date and locality, $\frac{2885}{HI}$
 1 ♂ Kufri, Simla Hills, May 1917, 8,000 ft. $\frac{7231}{HI}$
 2 ♀ ♀ near pool on Tiger Hill, Darjiling dist., 3,300 ft.
 26-vi-18, $\frac{1313}{HI}$
 1 ♀ immature, with exuviae. Nam Ting Pokhri, Sending Spur, 4,600 ft., no date, $\frac{1315}{H2}$
 1 ♂ Darjiling, 7,000 ft. (labelled by de Selys), $\frac{5667}{5}$
 2 ♂ ♂ For. Zool. Coll. Chahullia, Takula, Kumaon, May and June 1912 (*D. Imms*).
 B. 2 ♂ ♂ Sitong Ridge, Darjiling, alt. *circ.* 4,700 ft., 22-28-x-17, $\frac{8033}{HI}$
 2 ♂ ♂ 2 ♀ ♀ 3 larvae. Nam Ting Pokhri, Sending Spur, 4,600 ft., 22-x-17, $\frac{8011}{HI}$

I have grouped these specimens in two series, the reason for which action I will explain in the sequel.

Dealing with series A in the first place. These specimens are all evidently typical examples of *L. cyanea*.

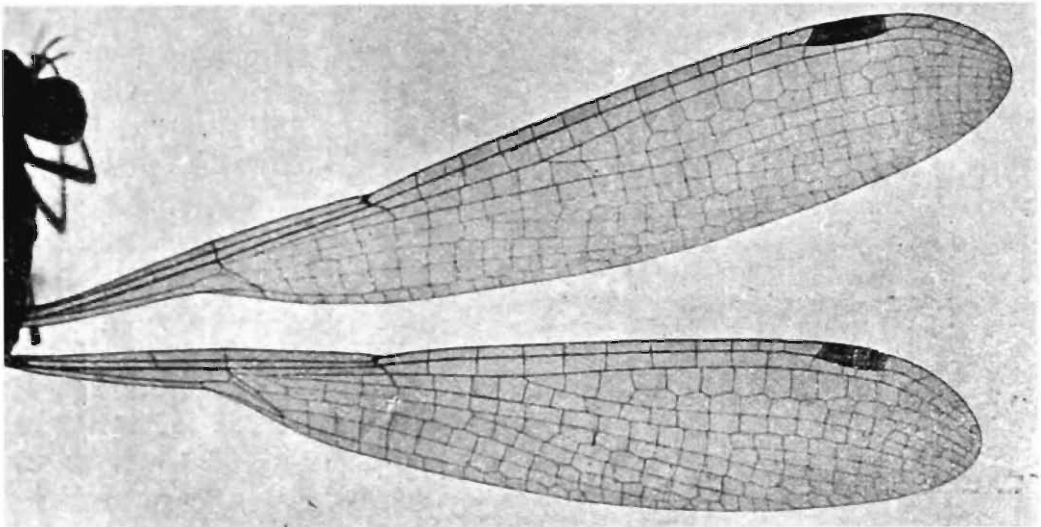
Below I give a short account of a male and female from the Simla Hills ($\frac{2884}{HI}$) taken in May.

Pterostigma black, antenodals on front wing 12-13.

♂ *Head*: Upper lip and anteclypeus with bases of mandibles and genae pale bright blue, otherwise dorsal surfaces black. Eyes gray-blue above passing to pale olive colour below.

Prothorax: Black dorsally, with a small median spot of bright blue, and a pair of lateral spots of the same colour. Ventrally greenish-white.

Synthorax: The dorsum is bronze-black with violet reflex. The mid-dorsal carina is finely marked with greenish-blue.



TEXT-FIG. 6.—Venation of *Lestes cyanea* ♂ from Sitong Ridge, Darjiling.

There is a narrow ante-humeral band of bright blue, limited externally by the humeral suture, and incomplete above. Laterally the colour is blue marked with a bronze-black band running upwards obliquely from the anterior half of the mesinfraepisternite, bounded anteriorly by the humeral suture. At its summit this band turns backward past the wing bases giving off a fine branch, which descends as a narrow black blue along the second lateral suture. The black band also encloses a small blue mark immediately behind the top of the humeral suture.

The wing bases themselves are marked with spots of blue; the under surfaces are pale greenish white.

Abdomen: Segments 1-6 vivid blue above, paler beneath, and marked with black as follows:—

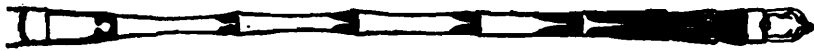
Segment 1 has a transverse basal line dorsally, and a pair of black lateral lines incomplete posteriorly; separating the bright blue of the dorsum from the paler ventral colouring.

Segment 2 has lateral bands of black meeting a fine black apical ring. These bands enclose the blue of the dorsum and are widened suddenly towards the hinder end of the segment so as nearly to cut off a small circular area of the blue from the rest of the blue colour.

Segments 3-6 have a very fine apical ring of black and apical lateral triangles, with their bases resting on the apical ring. These triangles are progressively longer from 3, where they occupy about one-sixth of the length of the segment to 6, where they occupy very nearly one-half. Segment 7 has the blue colouring so encroached on by the black lateral triangles that the blue is reduced to a basal ring from which a blue line runs black along the mid-dorsal carina. In 8 only the carina is left blue, and 9 is entirely black save for indication of a fine blue line at the base of the carina, 10 is blue, its marginal denticulations black.

Legs black anteriorly, greenish-brown posteriorly; *tarsi* and *spines* black.

Anal appendages: Upper pair about equal in length to segment 9 of abdomen; curved gently towards each other but at the apices curved outwards again, and rather acutely pointed. Each has at the end of its basal third a small internal blunt projection, and at about the junction of the middle and distal thirds a sharply pointed, backwardly directed spur. Lower pair one-quarter length of upper pair or less, bluntly conical, with rounded apices. (See pl. V, fig. 8.)



TEXT-FIG. 7.—Abdominal colour-pattern of *L. cyanea* Selys ♂. Not drawn to scale, Kufri 8,000 ft., May.

♀ *Head*, *prothorax* and *synthorax* with colour pattern identical with that of male, but the blue is replaced by a yellowish-green ground colour.

Abdomen: Segments 1-9 bronze-black above, greenish-white at the sides. Segment 1 has a median dorsal, squarish mark of light blue, 2 has a narrow median line of the same colour running along the dorsal carina, not quite attaining either end of the segment. Segments 3-7 have each of them a basal ring of blue immediately behind the basal margin of the segment, which is fairly ringed with black. The blue ring on 3 is very narrow, scarcely wider than the marginal ring of black. In the mid-dorsal line this blue ring is continuous with a very narrow blue line which runs along on either side of the mid-dorsal carina, which itself is exceedingly finely marked with black. On 4-6 the blue ring is progressively wider, in 6 it occupies the anterior fifth of the segment, and in each case it gives off a short median projection backwards, and is divided by the black blue of the mid-dorsal carina. In segment 7 the ring is rather of a bluish green colour, and it is narrower, equal only to about one-third of the width of that on segment 6.

Segments 8-9 are entirely bronze-black, and segment 10 is blue, its posterior margin with a deep angular incision (as also in the male) with a small basal spot of black, and small lateral spots of the same colour.

Legs as in the male, *anal appendages* white, shorter than the last segment.

Length of hinder-wing ♂ ♀ 24 mm., of abdomen ♂ 35+1.5 mm., ♀ 33 mm.

The specimens grouped under heading B have puzzled me greatly. They are all very immature, so much so that a specimen pinned for examination has shrivelled and has the abdomen hopelessly contorted. So far as I can make out they are all identical in structure, venation, and colour pattern with *L. cyanea*. But the *colouring* is different, the blue of *L. cyanea* being replaced by a shade of brown, which in the more nearly mature specimens is fairly dark.

Lastly as will be seen from the measurements given below the size is smaller. The pterostigma is brown.

Again the time of year when these specimens were taken was later than that on which the specimens of series A were caught for the most part, and the elevation less; October as against May, June, and 4,600 ft. as against 8,000 ft.

However, lately I have received from Dr. Annandale ♀ ♀ ($\frac{1313}{H_2}$) from Tiger Hill, Darjiling, which are typical *L. cyanea* from a height of only 3,300 ft. and a very immature ♀ ($\frac{1315}{H_2}$) probably taken about the same date (June) which in colouring shows little difference from the immature females of series B. Hence I conclude on present evidence, that probably the B series are merely young examples of *L. cyanea* that have not attained the adult pigmentation; and that the smaller size of the single ♂ fit for measurement is possibly due to incomplete expansion of the wings.

But it would be well worth while for collectors on the spot to determine whether or not there exists any seasonal form such as is possibly indicated by these specimens.

The wing figured and the anal appendages of the male are both taken from the least immature male of series B. As already stated I can find no structural differences separating them from series A.

Length of hinder-wing ♂ 22 mm., of abdomen c. 33 mm.

17. *Lestes* sp. †

(Text-fig. 8.)

2 ♀ ♀ Cherrapunji, Assam, 4,400 ft., 8-x-14, $\frac{8204}{20}$.

Length of abdomen 23.5 mm., of hinder-wing 19 mm.

These interesting little specimens are exceeding like a *Sympycna* in appearance. Mr. H. Champion, who was kind enough to

examine one of them for me, expressed the opinion that it bore a strong resemblance to that genus. This is in fact the case; the simple posterior margin of the prothorax and the shape of the pterostigma being the most important structural characters which separate it. The specimens are I think certainly very closely related to *L. bilineata*, Selys, but show some differences in detail.

Wings: Very narrow, hyaline with an uniform brown tinge, and with dark brown venation. Pterostigma bicoloured, its inner three-quarters dark brown, the outer quarter and the distal marginal vein yellowish white. This vein is much less oblique than is the inner marginal vein. The pterostigma is about three times as long as it is broad.

Ratio of greatest breadth of wing to greatest length about 1 : 5.

Head: Anterior surfaces yellow, dorsal surfaces including the post clypeus bronze-black, margin of occiput finely lined with yellow, posterior surface bronze-black.

Prothorax: Anterior lobe yellow, middle lobe yellow with a large bronze-black spot on either side, posterior lobe bronze-black, yellowish-white below.

Synthorax: Pale brownish-yellow, almost white below. On the dorsum is a broad bronze-black band with violet reflex, not separated so far as colour goes from its fellow of the opposite side by the mid-dorsal carina. This band is widened a little at about the middle of its height, and again at its upper end, where it lies against the ante-alar sinus. There are also three small isolated black spots on either side on the mesepimerite.

Abdomen: Pale brown passing to yellowish-white below.

Segment 1 has a square dorsal patch of bronze-black; 2 has a bilobed band of the same colour, contracted at its middle, and with its hinder lobe bifid. Segments 3-5 have each a pair of antero-lateral and postero-lateral bronze-black spots, the anterior pair on 5 being very small.



TEXT-FIG. 8.—Colour pattern of segments 2-3 of abdomen of *Lestes* sp. ♀ from Cherrapunji.

Segments 6-9 are without definite markings, but the brown colour of the dorsum is definitely darker than in the preceding segments and has a slightly metallic lustre. Segment 10 is yellowish white as are the anal appendages, which are cylindrical and a little shorter than the last segment. This latter has its

posterior margin very shallowly angulate

Legs: Long, the third femur when adressed reaching to the base of the first abdominal segment. Colour pale brown, the anterior surface of the tibia, the distal half of the anterior surface of the femur, and the tarsal claws brownish black. Tibial spines exceeding in length the tarsal claws.

18. *Lestes* ? *bilineata*, Selys.

Lestes ? *bilineata*, Selys, *Ann. Mus. Civ. Genova.* X (XXX), pp. 498—499. (1890—91).

A ♀ specimen in the British Museum labelled as *Lestes* ? *bilineatus*, Selys is evidently closely allied to the species last described. Unfortunately I have not had time to make a full examination of this individual, which is from Burma.

19. *Lestes* (*Sympycna*) *paedisca*, Everson. race. †

Sympycna paedisca, Kirby, *Cat. Odonata*, p. 164.

“ “ Förster, *Wien Entomol. Zeit.* XIX, p. 256—267, pl. iii, figs. 1-7 (1900).

“ “ Barteneff, *Ann. Mus. Zool. St. Petersburg*, XVI (1912-13).

Lestes paedisca, Ris, *Supplement. Entomol.*, No. 5, 1916.

4 ♂ ♂ 6 ♀ ♀ Jhelum Valley, Kashmir, 5,000 ft. (*H. T. Pease*) 1916, *Zool. S. Ind.*

These specimens all agree very closely with the form described by Barteneff as *S. paedisca*, approximating to *S. gobica*, Förster.

Ris (*loc. cit.*) makes some observations on the sections of the genus *Lestes*, which I have not yet had an opportunity of studying.

