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LXX.—On a small collection of Odonata (dragonflies) from Hainan, collected by the late John Whitehead

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IV. *Mus minutus minimus*.

Mus minimus, Gilbert White, Natural History of Selborne, pp. 33, 34, 39, & 43 (1789).

Mus messorius, R. Kerr, Animal Kingdom, p. 230 (1792).

An account of this form has been given in my paper already alluded to.

V. *Mus minutus pratensis*.

Mus pratensis, F. L. B. de Ockskay, Nov. Acta Leopold.-Carol. xv. 2, p. 243, tab. lxviii. (1831).

Mus arundinaceus (Petenyi), C. Chyzer, Rel. Pet. Termes-Fuzetek N. p. 91 (1881).

Hab. Western Hungary and Roumania (specimens seen from Czaloköz-somorja, plains of West Central Hungary, and from Gageni, Roumania).

Distinguishing characteristics. See my previous paper.

The dimensions of a female brought home by the late W. Dodson from Gageni, Roumania, where it was caught in an oat-rick on April 16th, 1899, are:—Head and body 63 millim.; tail 55; hind foot 14·5; ear 9.

LXX.—*On a small Collection of Odonata (Dragonflies) from Hainan, collected by the late John Whitehead.* By W. F. KIRBY, F.L.S., F.E.S., &c.

[Plate XII.]

HAINAN, a large island lying off the extreme south of continental China, is quite a new locality for dragonflies; and although the collection before me, which Mr. John T. Thomasson has kindly presented to the Natural History Museum, includes only fourteen species, yet, of the four species which I have described as new, two are the types of new genera and one of them is a remarkable form of quite extraordinary interest. Besides these, one or two of the other species are perhaps new, but the material obtained is insufficient to render it advisable to describe them.

In this and future papers I propose, in the case of known species, to quote the original reference, and my own Catalogue of *Odonata*, when no alterations or additions are required, instead of quoting the full synonymy.

The list of species is as follows:—

Libellulidæ.

LIBELLULINÆ.

Neurothemis, Brauer.1. *Tullia*, Dru.*Trithemis*, Brauer.2. *trivialis*, Ramb.*Crocothemis*, Brauer.3. *servilia*, Dru.*Zygonidia*, g. n.4. *insignis*, sp. n.*Orthetrum*, Newm.5. *testaceum*, Burm.*Diplacodes*, Kirb.6. *nebulosa*, Fabr.*Acisoma*, Ramb.7. *panorpoides*, Ramb.**Æshnidæ.**

GOMPHINÆ.

Æshna, Fabr.8. *Thomassoni*, sp. n.**Agrionidæ.**

AGRIONINÆ.

Matrona, De Selys.9. *basilaris*, De Selys.*Bayadera*, De Selys.

10. sp.

Pseudophæa, Kirb.11. *decorata*, De Selys.*Rhinocypha*, Ramb.12. *Whiteheadi*, sp. n.

CÆNAGRIONINÆ.

Ceriagrion, De Selys.13. *coromandelianum*, Fabr.*Pseudolestes*, g. n.14. *mirabilis*, sp. n.1. *Neurothemis Tullia*.*Libellula Tullia*, Drury, Ill. Exot. Ent. ii. pl. xlv. fig. 9 (1773).*Neurothemis Tullia*, Kirb. Cat. Neur. Odon. p. 8. n. 6 (1890).

Five specimens were obtained of this common East-Indian species.

2. *Trithemis* (?) *trivialis*.*Libellula trivialis*, Ramb. Ins. Névr. p. 115 (1842).*Trithemis trivialis*, Kirb. Cat. Neur. Odon. p. 18 (1890); De Selys, Ann. Mus. Genov. xxx. p. 467 (1891).*Diplacodes trivialis*, Karsch, Ent. Nachr. xvii. p. 246 (1891).

Three specimens obtained.

Dr. Karsch has pointed out that this species is not a true *Trithemis*, from which it differs in having the sectors of the triangle distinctly separated on the hind wings. He refers it to *Diplacodes*, the type of which is *D. tetra*, Ramb.; but from *Diplacodes* it differs in several important characters. The triangle of the fore wings is traversed; the subtriangular space consists normally of 3 cells, and only exceptionally of 2, whereas in *D. tetra* the usual number is 2, and only exceptionally 1 or 3; and the triangle is followed by one row of 3 cells and then several of 2. The more extensive genera of Libellulinæ need a further revision; typical *Trithemis* has the triangle followed by 3 cells, increasing, and *Diplacodes* by 2; and species with one row of 3 cells, followed by several of 2, do not, strictly speaking, belong to either genus. But I do not wish to subdivide existing genera in the present paper.

3. *Crocothemis servilia*.

Libellula servilia, Drury, Ill. Exot. Ent. i. pl. xlvii. fig. 6 (1773).

Crocothemis servilia, Kirby, Cat. Neur. Odon. p. 21. n. 3 (1890); Karsch, Ent. Nachr. xvii. p. 246 (1891); McLachl. Ann. & Mag. Nat. Hist. (6) xvii. p. 366 (1896).

A single specimen only.

As Dr. Karsch remarks, this species might easily be mistaken for *Orthetrum testaceum*, Burm., but that the last antenodal cross-nervure on the fore wings is not continuous.

ZYGONIDIA, gen. nov.

Frontal tubercle broad, not bifid; abdomen moderately long and slender, with a strong transverse carina on the third segment and a slighter one on the second, and a strong dorsal carina commencing on the third segment; segment 2 shorter than broad, 3 one and a half times as long as broad, 4-8 more than twice as long as broad, 9 a little longer than broad, 10 half as long as broad. Appendages of the second segment rather small; anal appendages slender and about as long as the ninth segment; lower appendage scarcely shorter than the others. Eyes large, connected for a moderately long space, and slightly expanded behind. Legs rather long; *claws bifid*; femora and tibiae very finely serrated on the upper carinae; femora beneath with numerous small teeth, mostly directed towards the knee, and with a few very long fine bristles towards the extremity; tibiae set with long fine hairs or bristles beneath.

Wings rather long and pointed, moderately broad; pterostigma rather short; fore wings with 16-19 antenodal and 10-11 postnodal nervures, *the last antenodal normally continuous*; nodal sector waved, sectors of the arculus stalked, rising at two thirds of its length; lower basal cell long and narrow, with a second cross-nervure towards the extremity; triangle rather small, traversed by one nervure, and followed by three rows of cells, increasing; lower sector of the triangle separated from the upper, and rising distinctly below the apex of the triangle, from which the upper sector rises; subtriangular space consisting of 3 cells; no supra-triangular nervures. *Triangle of the fore wings often rising distinctly beyond the level of that of the hind wings*, which is traversed by a nervure, and extends nearer the base than the level of the arculus; no supra-triangular nervures, one cross-nervure only in the lower basal cell of the hind wings; sectors

of the triangle narrowly separated at the base. Hind wings broader than the fore wings, with the anal angle rounded; membranule rather small.

Agrees with *Zygonyx*, Hagen, in many of its characters, but sufficiently distinct by the last antenodal cross-nervure of the fore wings being continuous (it is discontinuous on one side in one specimen), the longer pterostigma, the triangle of the hind wings being only followed by two rows of cells and its sectors almost united; the large number of cross-nervures, &c.

From *Protorthemis*, Kirb., to which it is also allied, it differs in its bifid claws, longer and slenderer abdomen, and in the form of the triangle of the hind wings.

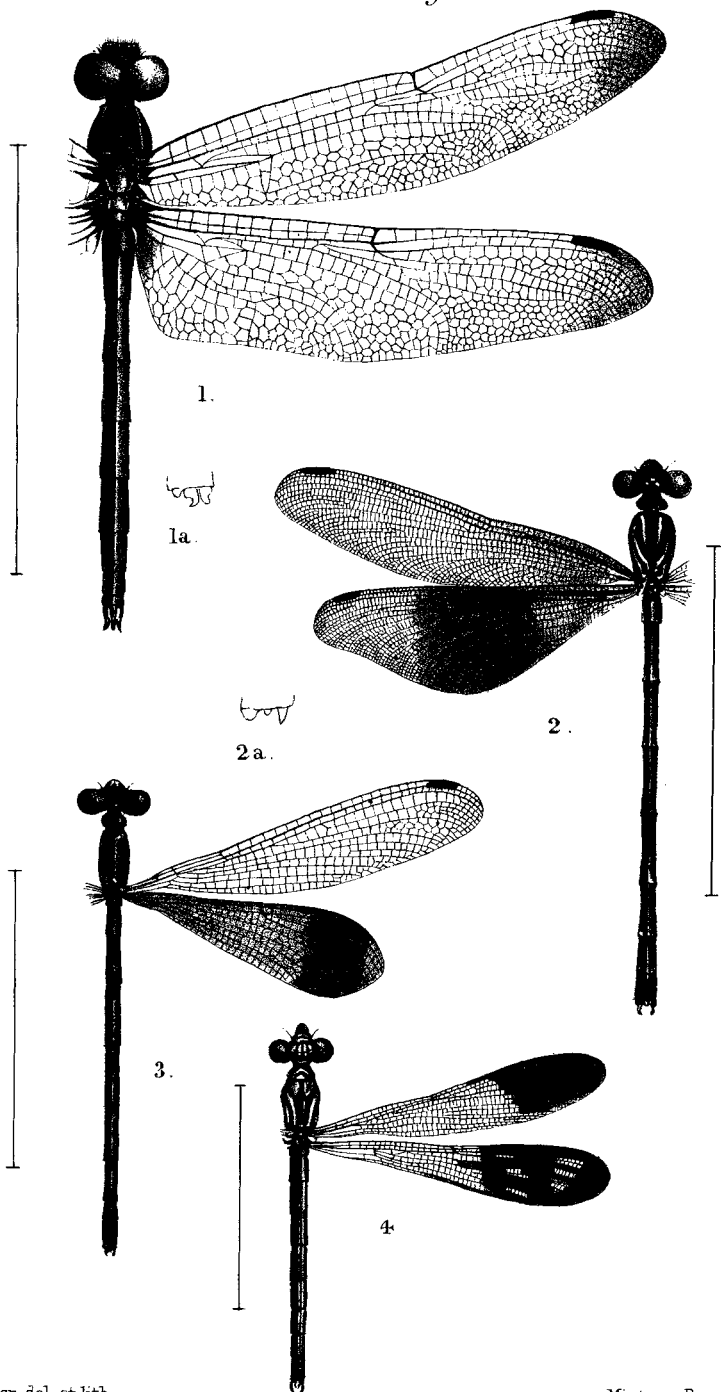
The genera allied to *Zygonyx* are so little known and the synonymy is so confused that I find it necessary to disentangle it, as far as the imperfect materials at my disposal at present will permit. My results will be found in a supplementary paper (*infra*, p. 539).

4. *Zygonidia insignis*, sp. n. (Pl. XII. fig. 1.)

Long. corp. 53-56 millim.; exp. al. 105-108 millim.; lat. al. ant. 11 millim.; long. pter. $4\frac{1}{2}$ -5 millim.; lat. al. post. 12 millim.

Male.—Head rich purple above, the frons narrowly bordered below with yellow, expanding into a large yellow spot on each side; nasus black, the sides and a small mark in the middle in front yellowish; rhinarium yellow; lower mouth-parts black, with the base of the mandibles and the sides of the mentum broadly yellow; back of head black, slightly spotted with yellow on the sides.

Thorax and abdomen black above; 3 yellow interalary spots, the first irregular, between the hinder part of the bases of the fore wings, the second longitudinal, and the third transverse, between the bases of the hind wings. Abdomen with the lateral carinæ (except that on the third segment), the longitudinal carina as far as the seventh segment, and the sutures to the end of the third segment narrowly marked with yellow; there is also a slight transverse yellow mark at the end of the fourth segment and others on the sides at the end of the fifth and sixth segments. Pectus and pleura reddish testaceous, the pleura with two large coppery-green spots, the hindermost greenest. Legs black, coxæ testaceous. First three segments of the abdomen beneath and on the lower part of the sides mostly testaceous, interrupted with black behind the segments and along the lateral carinæ; there is also a



double longitudinal testaceous median line as far as the seventh segment.

Wings hyaline, with a slight yellowish tinge, and of nearly equal length; pterostigma narrow, black, covering about three cells, and near the apex of the wing, which is clouded with smoky yellow beyond, the arculus rising at or very near the second antenodal cross-nervure. Wings nearly parallel to the level of the pterostigma, but the fore wings slightly expanding to the broadest point.

Two specimens only obtained.

5. *Orthetrum testaceum*.

Libellula testacea, Burm. Handb. Ent. ii. p. 859, n. 64 (1839).

Orthetrum testaceum, Kirb. Cat. Neur. Odon. p. 39, n. 47 (1890);

Karsch, Ent. Nachr. xvii. p. 246 (1891).

One specimen only.

This species appears to be pre-eminently insular in its tastes. There are specimens in the Natural History Museum from Penang, Dindings, Formosa, Philippines, Java, Borneo, and Celebes.

6. *Diplacodes* (?) *nebulosa*.

Libellula nebulosa, Fabr. Ent. Syst. ii. p. 379, n. 27 (1793).

Diplacodes nebulosa, Kirb. Cat. Neur. Odon. p. 42, n. 1 (1890); Karsch, Berl. ent. Zeitschr. xxxiii. p. 372 (1890).

A pair (♂ ♀) of this species, which, besides being Asiatic and not African, differs in several minor particulars from the type of the genus.

7. *Acisoma panorpoides*.

Libellula panorpoides, Ramb. Ins. Névr. p. 28, pl. ii. fig. 2 b (1842).

Acisoma panorpoides, Kirb. Trans. Zool. Soc. Lond. xii. p. 309 (1889); Cat. Neur. Odon. p. 43, n. 1 (1890).

One specimen only.

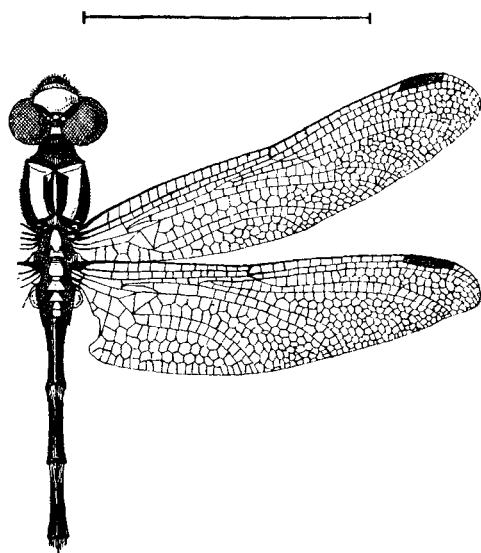
There are specimens in the Natural History Museum from China, India, Ceylon, Singapore, and Lombok.

8. *Æshna Thomassoni*, sp. n.

Exp. al. 74 millim.

Male.—Head black; a green band between the eyes on the occiput and another in front of the ocelli; a large yellow spot at the base of the mandibles. Pronotum black, with two small green contiguous spots in the middle. Mesonotum velvety black; a broad green band, connected in front, on

each side, the space between brownish black, bordered with reddish, and bisected by the median carina, which is green in front. Mesopleura black, with a broad central green band; metapleura and sides of the first two segments of the abdomen almost entirely green; pectus yellow and black; legs black, with a green streak on the underside of the front femora. Longitudinal alary spaces mostly green, and green dots at the base of the wings. Abdomen with a triangular green spot in the middle of the first segment, an oval yellow one on the second, an incomplete yellow median stripe on the third; a bifid spot at the base of the fourth and fifth; the remaining segments wanting. (The yellow markings may be green during life.) Earlets large, yellow.



Wings hyaline, with brown nervures; pterostigma covering about six cells; fore wings with 17 antenodal and 12-13 postnodal nervures; anal triangle of the hind wings composed of four cells, the fourth small, quadrate, on the middle of its inner edge, which is angulated inwards a little below it. Membranule of hind wings very small, linear, whitish.

A single imperfect specimen.

Somewhat resembles *Æ. Pryeri*, De Selys, but abundantly distinct.

9. *Matrona basilaris*.

Matrona basilaris, Selys, Syn. Cat. p. 17 (1853); Kirb. Cat. Neur. Odon. p. 100. n. 1 (1890).

Four specimens, three males and one female.

This species was formerly represented in the Natural History Museum by *M. nigripectus*, De Selys.

10. *Bayadera*, sp.

A single specimen of a very distinct species, with lateral greenish stripes on the thorax, and stained with smoky yellow towards the base, and broadly along the costa of all the wings nearly to the pterostigma. The tips of the wings are also infuscated nearly to the level of the base of the pterostigma. Unfortunately both the thorax and abdomen are so much damaged that it is not desirable to describe the species from so defective a specimen, especially as it is not improbably immature.

11. *Pseudophæa decorata* (?). (Pl. XII. fig. 2.)

Euphæa decorata, De Selys, Syn. Cat. p. 51 (1853).

Pseudophæa decorata, Kirb. Cat. Neur. Odon. p. 109. n. 6 (1890).

A male specimen considerably larger than the dimensions given by De Selys, and with the brown band of the hind wing extending basally as far as the nodus, and in the middle of the wing further than this point. It may be a distinct species, but in the absence of a typical specimen of *P. decorata* to compare, it would not be advisable to describe it from a single specimen.

12. *Rhinocypha Whiteheadi*, sp. n. (Pl. XII. fig. 4.)

Long. corp. 27 millim.; exp. al. 47 millim.

Male.—Black; vertex between the eyes with a transverse row of four blue spots; pronotum lilac above, with transverse black carinæ and two blue spots on each side; mesonotum with a lilac triangular spot in the middle at the base and a blue dash on each side; at the extremity is a blue spot on each side; mesopleura blue, nearly divided in two by a black space from behind, and projecting a short streak in front; metapleura blue, the suture between broad behind; interalary space spotted with blue, with a white spot between each pair of wings, and a white curve on each side of the front spot; legs white beneath; abdomen with the first segment blue on the sides and narrowly behind, second and third

segments blue on the sides, and also above, except the black central carina and the hinder part of segment 3; the following segments with terminal blue lateral spots, only distinct on the third, seventh, and eighth segments. Fore wings hyaline, blackish in the costal area from the fifth postnodal cross-nervure, and from about half the distance between the nodus and the black pterostigma the apical portion of the wing is purple to the tip, but leaving the inner margin below the purple portion dusky and shot with iridescent blue. Hind wings purple from the second postnodal cross-nervure to the tip; the inner marginal area, however, is only dusky from half the distance from the quadrilateral to the purple part of the wing, and as far below the latter. The purple part of the wing is crossed by two rows of long iridescent subhyaline spots: the outer row consists of a broad upper one, a narrow middle one, and a broad lower one, divided by two longitudinal nervures; the inner row consists of three long subhyaline iridescent spots, the middle broadest, but with its upper half shorter than the lower; besides these, a similar long iridescent subhyaline spot projects inwards into the hyaline part of the wing from the middle of the purple part.

Two specimens; one immature, in which the purple part of the wing is much paler, the blue spots on the head and abdomen are wanting, and the pterostigma is pale in the outer half.

Belongs to the group of *R. perforata*, Perch.

13. *Ceriagrion coromandelianum* (?).

Agrion coromandelianum, Fabr. Ent. Syst. Suppl. p. 287 (1798).

Ceriagrion coromandelianum, De Selys, Bull. Acad. Belg. (2) xlii. p. 528 (1876).

Agrion cerinum, Rambur, Ins. Névr. p. 279 (1842).

A single male specimen, agreeing with *C. melanurum*, De Selys, in size and in having 13 postnodal cross-nervures, but differing in the uniform colour of the abdomen and in the wings being petiolated as far as the basal postcostal nervure, in which characters it agrees with *C. coromandelianum*.

PSEUDOLESTES, gen. nov.

Wings petiolated nearly as far as the basal postcostal nervure, which is placed nearly halfway between the level of the two antenodal cross-nervures, or nearer the second; second antenodal cross-nervure almost corresponding with the arculus, the sectors of which rise close together above the

middle; arculus angulated where the lower sector rises, the median and subnodal sectors rising a little beyond the arculus, as in *Lestes*. Quadrilateral very long, especially on the hind wings, a little narrower above than below. Pterostigma long and thick, covering from two to four cells, acutely angulated inwards on its lower side. Lower sector of the quadrilateral long, slightly undulated on the fore wings. Nodal sector rising between the third and fifth postnodal cross-nervure, and the ultranodal sector at the level of about the eighth and ninth, above and below which, and also above and below the subnodal sector, are two shorter intercalated sectors, increasing in length as they approach the median sector. On the hind wings there are only three pairs of intercalated sectors, placed below the ultranodal sector, the subnodal sector, and the lower sector of the arculus respectively. The fore wings are rather long and narrow, and the hind wings are one third shorter, rather broader, and coloured. Front moderately prominent, rounded. Terminal appendages in male destroyed (probably hooked), in female straight, pointed, longer than the tenth segment; lower appendage stout, terminating in a strong obliquely raised pointed tooth, below which are a pair of short filiform appendages.

This is the most remarkable form in the collection, and stands about midway between three distinct subfamilies. It has the colour and general shape of *Pseudophæa decorata*, De Selys, which was received with it; the quadrilateral and pterostigma of *Podopteryx*; and the median and subnodal sectors of *Lestes*, from which it differs, however, in none of the sectors being visibly undulated, except the lower sector of the arculus on the fore wings. It should certainly form the type of a new subfamily.

14. *Pseudolestes mirabilis*, sp. n. (Pl. XII. fig. 3.)

Long. corp. 35–37 millim.; exp. al. ant. 56–60 millim.; exp. al. post. 42–45 millim.

Head black; ocelli yellow, in an equilateral triangle on the vertex; in some males a pale greenish-blue spot on each side of the inner orbits opposite the frontal ocellus and a transverse band in front of it, and all the rest of the face above of the same colour. Antennæ with the basal joint short and thick, the second much longer but of equal thickness, the flagellum hair-like, longer than the two other joints together. Body bronzed; pronotum rather large, with a testaceous lateral band, partly continued on the mesonotum; mesopleura with three testaceous stripes, the upper one linear,

the two lower ones broader and subcontiguous, the middle one interrupted. Legs black, with the femora inclining to rufous; bristles long and slender, not very numerous. Fore wings hyaline, with black pterostigma and nervures and with 18-21 postnodal cross-nervures. Male with the hind wings smoky brown towards the base and along the costa and the outer two fifths darker brown; on the middle third of the inner margin is a large orange space, extending nearly to the costa, and the tip of the wing is of the same colour. On the underside the large orange blotch and most of the space between this and the tip is clothed with silvery-white scales, the portions of the wing not thus covered being black, with a strong green and coppery iridescence. In the female the hind wings are hyaline yellow, with a broad black subapical band, with a strong green and coppery iridescence both above and below.

Described from six specimens, three of each sex.

EXPLANATION OF PLATE XII.

Fig. 1. *Zygonidia insignis*, gen. & sp. n., p. 533.

Fig. 2. *Pseudophæa decorata* (?), De Selys, p. 536.

Fig. 3. *Pseudolestes mirabilis*, gen. & sp. n., p. 538.

Fig. 4. *Rhinocypha Whiteheadi*, sp. n., p. 536.

LXXI.—On the Species which have been included in *Zygonyx*,
Hagen and De Selys. By W. F. KIRBY, F.L.S., F.E.S.,
&c.

I now take the opportunity of publishing the notes referred to in the preceding paper.

Genus ZYGONYX, Hagen and De Selys.

- (1) Hagen, Verh. zool.-bot. Ges. Wien, xvii. p. 62 (1867).
- (2) Brauer, *op. cit.* xviii. p. 370 (1868).
- (3) *Id. op. cit.* p. 742 (1868).
- (4) De Selys, Ann. Soc. Ent. Belg. xii. p. 96 (1869).
- (5) *Id.* Ann. Nat. Hist. (4) iii. p. 274 (1869).
- (6) *Id.* Bull. Acad. Belg. (2) xxxi. p. 520 (1871).
- (7) Karsch, Berl. ent. Zeitschr. xxxiii. p. 281 (1890).
- (8) De Selys, C. R. Soc. Ent. Belg. xxxv. p. cccxxvii (1891).
- (9) Calvert, Proc. Acad. Nat. Sci. Philad. 1899, p. 245.

Hagen and Brauer (1-3) briefly notice this MS. genus of De Selys as belonging to the Corduliidæ and as including