

## ADDITIONS AND CORRECTIONS.

Page 4, line 3 from top, *after* "forms" *read* also in *Leptohyphes* and in the subimago (not the adult) of *Ephemerella*, it is there, &c.

P. 20, l. 17 from top, before "*Bætisca*" insert *Cloëon, Baëtis* (with three sections).

P. 21, l. 2 from bottom, *for* "Serie" *read* Series.

P. 22, l. 11 from bottom, *dele* "al" so as to *read* functionless.

P. 36, l. 18 from bottom, *for* "Section 2 of the Genus" *read* Section 2 of the Genera.—

P. 81, l. 12 from bottom, *for* "*Hagenulus*" *read* *Teloganodes*.

P. 95, l. 8 from bottom, *add* Mr. Albarda has lately sent me specimens representing both sexes of the imago and the ♂ subimago of *L. Meyeri* captured in the Netherlands at Ginneken, N. Brabant, and at Arnhem, Guelderland, which I returned to him undescribed a few years ago.

P. 101, l. 15 from top, *after* "172 (1863)" *add* ; Walsh, *op. cit.* ii. 189 note 14, and 194 note 15 (1863).

P. 101, l. 18, *after* [details] *add* ; Packard, in 3rd Rep. U.S. Ent. Comm. chap. xi. (part), pls. xlv.—xlvi. [morphology] (1883).

P. 106, l. 10 from top, *after* Italy *read* Spain. Again, *after* "Portugal," *add* A specimen from San Ildefonso, Segovia (*Meyer-Dür*) is in Mr. Albarda's collection.

P. 109, l. 4 from top, *for* Palenburg *read* Palembang.

P. 114, l. 9 from top, *for* nodal point *read* bulla.

P. 122, l. 1, *before* Algarve *read* Spain.

P. 122, l. 14, *after* grey *add* ; neuration in opaque view concolorous with the membrane.

P. 122, l. 13 from bottom, *add* A single ♀ subimago, considerably damaged by *Anthrenus*, from San Ildefonso, Segovia (*Meyer-Dür*), in Mr. Albarda's collection has the wing 8.5 mm. long.

P. 124, l. 2 from bottom, *before* Guard *insert* The recurrent membrane of the fore wing-roots extends in the form of short subulate points beyond the peak of the scutellum in the subimago ; but these mesonotal appendages are wanting in the imago.

P. 139, l. 13 from bottom, *add* In translating the description of this species in 1871, I carelessly wrote ventralibus for dorsalibus.

P. 141, l. 20 from bottom, *for* "Homologue of the forceps-basis undeveloped in ♀," *read* Ventral lobe of ♀ segment 9 obtusely rounded off and entire.

P. 143, l. 2 from bottom, *for* var. RIVULORUM *read* CÆNIS RIVULORUM, sp. nov.

P. 144, l. 8, <sup>from top</sup> to the localities quoted, *add* Also the Eden in Cumberland ; profusely abundant at Langwathby on certain evenings towards sunset so as to produce an appearance as of mist or dense haze hovering over the course of the river. A single Scotch specimen is in Mr. King's collection.

P. 160, l. 2 from bottom, *after* Brook ; *add* abundant in Briggie Beck and in the Eden near Little Salkeld in Addingham, Cumberland ;

P. 186, l. 15 from top, *for* Teneriffe, common near the Jardin, *read* common in a Fonda at Puerto de la Orotava, Tenerife, and near the Jardim.

This relates to *CHIROTONETES* (?) *ORNATUS*, p. 208.

*Subimago* (*dried*).—Wings whitish grey; fore wings less yellowish at the roots than in *Coloburus humeralis*, having a small yellowish spot at the roots of the subcosta; cross-veinlets bordered with brown-black (corvinous), their bordering confluent here and there into spots producing an irregular chequered appearance amongst the reticulation. *Setæ* warm sepia-brown, with dark joinings.

*Imago* (*dried*).—Notum of ♂ black or pitch-brown; that of ♀ fusco-luteous or brown-ochreous. Dorsum of abdomen rufo-fuscous, with a dark triangular spot behind on each side of every intermediate segment, before the apex of which is an ochraceous space [=? a lateral series of oblique dark stripes each enclosing a pale space]. *Setæ* fuliginous or warm sepia-grey with darker joinings. Antepenultimate [? ventral] segment of ♀ usually conspicuously paler than the others, and traversed lengthwise by three black lines. Fore legs brown-ochreous, the hinder legs flavescent, with black or dark-grey markings, viz.:—a band in the middle and another at the tip of the femur, the tip of the tibia, the joinings and, to a large or small extent, the last three joints of the tarsus. Wings vitreous; fore wing faintly yellowish or amber-tinted in the first portions of the marginal and submarginal areas, and tinged with brown-black in the pterostigmatic region, where the cross-veinlets are dark-bordered, simple, and straight: neuration for the most part pitch-black, but the subcosta and radius are yellowish towards the base. Length of body 14–15, wing 12–16; *setæ* ♂ and ♀ im., 16 and 1, subim. ♂ about 13, ♀ 11 mm.

*Hab.* Christchurch, New Zealand. Easily distinguished from *Coloburus humeralis* by the dark-bordered cross-veinlets of the wings forming here and there irregular blots, by the smaller extent of the yellowish tint at the wing-roots, and by the banded femora. Described and illustrated by me in 1876 after specimens at that time in the M'Lach. Mus.

P. 210, l. 14 from bottom, *add* and Europe.

P. 216, l. 4 from bottom, *add* I have lately seen, in Mr. Albarda's collection, a single ♂ subim. captured by Meyer-Dür at the same place. The Portuguese nymph figured in Pl. L. is probably of this species. These nymphs were plentiful in a streamlet near Saõ Barnabe in Algarve at an altitude of 700 ft. [water 64° F., 12th May, 1880, in the afternoon], and there were sloughs relinquished by the subimago on some of the stones in the stream; but I failed to find the fly.

P. 232, l. 6 from top *add* :—

A fragmentary ♂ imago, probably of this species, forwarded to me, without record of locality, by M. Frey-Gessner, differs from the specimen described at p. 231 *supra* and figured in detail in Pl. XXII. in the following particulars:—Many of the cross-veinlets of the pterostigmatic portions of the marginal areas of the fore wings are forked near the costa and some of them anastomose with one another; the two short intercalary nervures in the anal-axillar interspace of the fore wing, which are next to the 1st axillar nervure, end inwards abruptly; the narrow linguiform penis is entire, not incised at the

tip; the forceps-basis is less deeply emarginate behind; and in segments 8 and 9 the venter is more of a light brown-ochre or "fuscous" in colour. Differences in the state of preservation of the specimens may be held to account sufficiently for most of these discrepancies, and individual idiosyncrasy for the remainder. From the coloration of the abdomen of the adult fly, I am led to infer that the abdominal pairs of tracheal branchiæ of the nymph are seven in number.

P. 233, l. 4 from bottom, *for* tibia *read* tibiæ.

P. 238, l. 12 from bottom, *for* EPEORUS GEMINUS, sp. nov., *read* :—

EPEORUS SYLVICOLA, Ed. Pictet.

‡ *Baëtis sylvicola*, ! Ed. Pict., Synop. Névropt. d'Espagne, 24, pl. iii. 7-12 (1865).

*Heptagenia sylvicola*, ! Etn., Trans. Ent. Soc. London (1871), 147.

*Epeorus geminus*, ! Etn., at p. 238, *supra* (1885).

*Subimago* (*dried*), ♀.—Wing-membrane sepia-grey; neuration for the most part (in opaque view) pitch-black, the subcosta being so entirely, in both wings, but the proximal ends of the other main longitudinal nervures become light bistre-grey, and the tegulæ are light yellowish: cross-veinlets in both wings narrowly and very faintly bordered with light grey. Setæ intense warm sepia-brown, with black joinings. Length of body, ♂ 12, ♀ 13; wing ♂ 15, ♀ 16 mm.

P. 239, l. 14 from top, after the parenthesis *insert*; Spain, San Ildefonso, Segovia (Ed. Pict.). M. E. Frey-Gessner lately transmitted to me for examination the type specimens of this species; and I have consequently been able to identify my Portuguese *Epeorus* with Ed. Pictet's ‡ *B. sylvicola*.

P. 239, l. 6 from bottom, *for* 1835 *read* 1885.

P. 239, l. 7, *add* Also the Vosges (Puton, MS.).

P. 242, l. 14 from bottom, *add* Plate LXV. 13 (♂ genitalia).

P. 249, l. 20 from bottom, *for* "anastomo seat all" *read* anastomose at all.

P. 252, after l. 20 from top, *add* :—

*Type.* *Rh. semicolorata*, Curt.

*Distribution.* N. America and Europe.

*Etymology.* ῥέϊθρον, a stream, and γένοc.

P. 266, after l. 16 from top, *add* :—

*Type.* *H. flavescens*, Walsh.

*Distribution.* Northern Hemisphere from about 30° N. lat. within the Arctic Regions.

*Etymology.* ἑπτά and γενεά, in reference to the genus being seventh in a series.

The following descriptions refer to the North-American species of *Heptagenia* (*antea*, p. 266).

Since the publication of the descriptions of *H. flavescens* and *H. interpunctata*, p. 266 and p. 267, a large series of the latter species and kindred forms has been added to Mr. M'Lachlan's Collection. I have examined these, and I am led to suspect that the

North-American species differ generically from the European and Asiatic species heretofore described, pp. 268-274.

The descriptions which here follow take cognizance only of the adult and subimago conditions. It may, however, hereafter be found that when the nymph-stage of the American form is fully worked out, the opinions here offered tentatively may require modification.

The following characters of the American species of *Heptagenia* should be taken into consideration with the characters of the genus already given at p. 265.

P. 265. *Adult*.—First joint of the hind tarsus equal or subequal to the third joint; first joint of the ♂ fore tarsus about half as long as the second, and this rather shorter than the third joint; first joint of the ♀ fore tarsus little more than half as long as the second, which is very little shorter than the third joint. Penis-lobes slightly flattened; their extremities roundly truncate.—Fore leg of ♂ about  $1\frac{1}{6}$  as long as the body; the tarsal joints, in the order of their shortening, rank in the ♂, 3, 2, 4, 1, 5, and the first is about  $\frac{1}{2}$  as long as the second joint; and in the ♀ 3, 2 equal to 5, 1 equal to 4, and the first is  $\frac{5}{12}$  as long as the second, or  $\frac{1}{2}$  as long as the third joint. The joints of the hind tarsus in the order of their shortening rank in ♂ 2 equal to 3 equal to 5, 1, 4; in ♀ 5, 2 equal to 3, 1, 4, or 1 equal to 4. Ventral lobe of ♀ segment 9 emarginate. Outer caudal setæ of ♂  $3-3\frac{1}{2}$  the length of the body; those of ♀  $1\frac{1}{2}-2$  its length.

Supplementary to *Heptagenia interpunctata*, see p. 267.

‡ *Baëtis canadensis*, var. (?), ! Walk., List of Neuropt. Ins. in Brit. Mus. part iii. 570 (1853) [?].

*Subimago (dried)*.—Wings extremely light yellowish ochre, with neuration at first nearly concolorous with the membrane, and with the extreme edge of the hind wing at the apex and terminal margin blackish grey. The wing-neuration undergoes changes of colour during the maturation of the insect similar in their nature to those described under *Heptagenia sulphurea*, the greater part of it, in specimens very near the last moult, becoming bistre- or raw-umber brown, and only the stronger nervures remaining yellowish in opaque view. In the fore wing the cross-veinlets of the foremost three areas (but not the great cross-vein) are black: the dark pigment in many of the specimens spreads a little, anteriorly, on each side of nearly every cross-veinlet in the marginal area; and in the third of those areas, minute, more or less circular, dark-grey median single spots are similarly apt to be formed upon some or all of the cross-veinlets in the basal half of the area, and where the cross-veinlets are close together near the bulla of the radius two or three of the spots often run together into a dark dash traversing the middle of the cross-veinlets: some of the specimens have none of these spots. In the remainder of the fore wing the cross-veinlets gradually become dark. Setæ uniformly light brownish.

*Imago (dried)*, ♂.—Notum light yellowish approaching yellow-ochre, excepting the pronotum, which in some lights approaches pale raw-umber brown; the sides of the thorax are varied with a much paler yellow. Abdomen in segments 1-8 semitransparent greenish white, with the terminal borders of the segments edged evenly and nar-

rowly with bistre-brown on the dorsum, and with a lighter brown on the venter; segments 9-10 and sometimes part of the preceding segment opaque light-yellowish ochre, mingled on the dorsum with a paler yellow. Setæ, in opaque view, uniformly warm sepia-brown. Coxæ concolorous with the thoracic pleura. Fore femur, *in opaque view*, light brownish olive, banded narrowly with blackish in the middle and close to the tip; tibia and tarsus somewhat of a medium sepia-brown, the tibia in some postures, however, assuming the colour of the femur, with the insertion of the tarsus sepia-brown, and the tarsus becoming very light sepia-grey: *in transmitted light* the femur and tibia are a rich translucent yellowish or greenish amber; the tarsus remains dull. Hinder femora and tibiæ paler and more transparent than those of the fore leg; *during life* the pigment forming the femoral markings may perhaps be arranged in bands; but *in dried specimens* these markings consist of a small grey median spot, and another just before the tip, which is small, elongated, and blackish, and is flanked on each side by a very fine abbreviated black line in the edge of the limb. *In some lights* the hinder tarsi, and even the tibiæ also, appear light brownish, or brownish grey; *in other postures* only the tarsal incisures are very narrowly brownish; *in transmitted light* the femora and tibiæ become whitish amber, and the tarsi with (sometimes) the extreme tips of the tibiæ remain dull or blackish grey. Wings vitreous: in the fore wing the membrane of the marginal and submarginal areas, from the base to the beginning of the pterostigmatic region, is, for the most part, sometimes colourless like that of the disk, but usually has a very faint amber tint; the remainder of these areas is suffused distinctly with transparent colouring that varies in tint with change of posture from dull light reddish or reddish brown, to bistre-grey or raw umber-grey, and this colouring extends further along the margin to the extremity of the wing; in the marginal area the same colouring becomes rather faint near the costa. The markings of cross-veinlets in the fore wing are the same in the adult as in the subimago, when there are any at all. Where in the subimago the edge of the hind wing is black, it is not only so in the imago also, but the wing is there bordered narrowly with a bistre-grey cloud, which is shaded off inside and gradually diminishes in width posteriorly. Neuration of the fore wing *in opaque view* pitch-black, excepting the stronger portions of the costa, subcosta, and radius, and also the basal extremities of the other longitudinal nervures, which in some postures appear paler, or light bistre-brown: *in other positions* the neuration altogether, or else only the longitudinal nervures, becomes translucent rufo-piceous. The pterostigmatic nervures are simple and not crowded together.

♀. Very similar to the ♂, especially after oviposition: prior to this, the body is of a richer yellow-ochre in its ground-colouring, and of course the abdomen is not translucent. The marginal and submarginal areas are sometimes almost colourless; sometimes only the latter area, especially in the pterostigmatic region, is slightly amber-tinted, this tint extending onwards along the margin to the extremity of the wing; sometimes both these areas and the colouring continued from them to the tip of the wing are light amber-tinted, and a small reddish cloud lies between the costa and the radius at about  $\frac{1}{4}$  of the distance beyond the bulla towards the tip; sometimes the reddish tint is as

extensively diffused in the pterostigmatic region as it is in most specimens of the other sex. The hind wing is faintly amber-tinted to a considerable depth along the grey or blackish apical or terminal margins. In the fore wing the lighter portions of the longitudinal nervures are rather paler than in the ♂, and the great cross-vein is paler than the cross-veinlets; the caudal setæ are lighter in colour. Length of setæ ♂ im. 25–35, ♀ im. 25 mm.

*Hab.* North Carolina (M'Lach. Mus.). For comparison with the tabulation of proportional lengths of tarsal joints of representatives of other genera given above at p. 236, the corresponding admeasurements of the tarsi of adult specimens of this species are here subjoined:—

	Fore tarsus.					Intermediate tarsus.					Hind tarsus.				
	I.	II.	III.	IV.	V.	I.	II.	III.	IV.	V.	I.	II.	III.	IV.	V.
♂ . . . .	10	20	24	16	8	5	7	7	4	7	5	6	6	3	6
♀ . . . .	6	11	12	6	11	5	8	8	5	9	5	7	7	4	9

In the fore leg of the ♂ the tarsus is about  $1\frac{5}{8}$  as long as the tibia; in the ♀ the fore tarsus is about  $\frac{5}{8}$  as long as the tibia.

P. 268, l. 10 from top, *for* Subz. *read* Sulz.

P. 270, lines 15 to 3 from bottom, *note* To *H. cærulans* belongs all that relates to *H. gallica*, given below at pp. 272–273. I have lately examined specimens of *H. cærulans* in Mr. Albarda's collection named by Herr Rostock, and can now vouch for the identity of *H. gallica* with *cærulans*.

P. 272, l. 5 from top, *for* GALLICA, sp. nov., *read* [*gallica*, Etn. MS.=] CÆRULANS, Rostock.

P. 272, l. 7 from top, after "*Heptagenia*" *read* *cærulans*, ! Rostock, Jahresb. d. Ver. f. Naturk. Zwickau, 1877, p. 89 (1878).—*Heptagenia*.

P. 273, lines 14 from top, *after* "*Hab.*" *insert* Weisseritz, near Dretschén, Saxony (Rostock).

P. 273, lines 16–18 from top, *omit* all references relating to *H. volitans*.

P. 274, *dele* lines 22–24 from top, and lines 1–4 from bottom. *Note* *H. volitans* is an *Ecdyurus* described at p. 291.

P. 306, l. 6 from bottom, *for* Prof. *read* M.

P. 307, l. 18 from top, *for* Retourna *read* Retourner.

P. 307, l. 11 from bottom, *for* 2; (?) sp., *read* ; (?) 2 sp.

P. 309, l. 5 from bottom, *for* (3) *read* (8).

P. 315, l. 20, *for* *Coloburus*, *read* *Coloburiscus*.