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To the knowledge of fossil insects from  
Jurassic beds in Turkestan.

A. Martynov.

(Présenté par A. Karpinskij, de l'Académie des Sciences, le 4 Mars 1925).

3. *Hymenoptera, Mecoptera*<sup>1</sup>.

Order **Hymenoptera**.

Some previous notices on the nervuration.

The interpretation of the very specialized nervuration of the wings in *Hymenoptera* up to the last time was hypothetical. No transitional forms connecting the *Hymenoptera* with more primitive groups, namely with neuropteroid insects, were known. Therefore various authors based the interpretation of the nervuration on the tracheation of the nymphal wings. As the history of tracheation often does not coincide with the history of nervuration, the authors, naturally, arrived to very different conclusions. Thus, according Comstock and Needham 1898—1899, Mc Gillivray, Comstock 1918, the greatest part in the wings occupies *M*, then *RS*, whilst *Cu* is much shortened. Handlirsch, on the contrary, considers the greatest part of the wings to belong to *Cu*. In 1924 R. I. Tillyard described from the permian beds of Kansas several interesting forms, exposed by him as a separate order *Protohymenoptera*, the wing-nervation in which, preserving somewhat an aspect of *Neuroptera*, at the same time acquired some specialisations, characteristic for the *Hymenoptera*, and thus provided him with the possibility to give a new interpretation of the nervature in *Hymenoptera*. I agree with him except the denomination of anal nervures, both in anterior and, especially, in the posterior wings. I denominate *Cu*<sub>2</sub> as *A*<sub>1</sub>, the following veins *A*<sub>1</sub> and *A*<sub>2</sub> (of Tillyard) I take for *A*<sub>2</sub> and *A*<sub>3</sub>. According to my view, *A*<sub>1</sub> in the posterior wings disappeared, and only a small

<sup>1</sup> First Part see the Bulletin № 6—8, 1925, pp. 233—246; Second Part — Bulletin № 12—15, 1925, pp. 569—598.

nervule at the base of *Cu* in *Macroxyela*, *Megaxyela* and *Odontophyes* is, perhaps, a remainder of  $A_1$ . The following nervures, which Tillyard considers to be  $Cu_2$  and  $A_1$ , are in reality  $A_2$  and  $A_3$ . Next to  $A_3$  is placed a longitudinal fold, characteristic for the most pterygotan insects (*Neoptera* m.), separating anal region from the enormously augmented jugal one (= neala m.). The vein, running inside this jugal region, is, obviously, not an anal, but jugal vein, which I named *vena arcuata*.

In the following pages I shall avail myself of this interpretation.

### Superfamily Tenthredinoidea.

#### Family Anaxyelidae, n. fam.

In the presence of a long ovipositor and in some primitive characters of the nervuration resembles somewhat *Xyelidae*, but differs in the simple antennae, consisting of more homonomous joints, and in the nervuration of the wings. In the anterior wings there is no free subcostal vein, which is, probably, fused with  $R + M$ ; the stem of  $M$  is long, as in *Xyelidae*, but  $M_1$  absent; proximal cell between  $M$  and *Cu* small. In the posterior wings median cell is short, closed by an oblique nervule.

#### Genus *Anaxyela*, n. gen.

Two basal joints of antennae moderately elongated, 3—4 (preserved) following gradually becoming shorter. In the anterior wings  $R + M (+ Sc)$  thick, pterostigma rather slender; in the costal area of the left wing one can perceive indistinct traces of 3—4 transverse nervules;  $M_{1+2}$  connected to *Pt* by two cross-veins;  $M_{3+4}$  nearly straight, connected distally with  $M_2$  by only one cross-nervule; basal portion of  $M_{1+2}$ , up to the connection with *Pt*, is very short. Proximal cell between  $M$  and *Cu* rather small and closed posteriorly by a convex nervule; the cell between *Cu* and  $A_1$  is somewhat elongate;  $A_3$  sinuous. In the posterior wing (fig. 14) the cross nervule between  $M_{1+2}$  and  $M_{3+4}$  (*im*) is oblique and forms, nearly a continuation of cross-nervule  $cu - m$ ;  $A_2$  with a short continuation after the cross-nervule  $Cu - A_2$ .

#### *Anaxyela gracilis*, n. sp.

(Fig. 13 and 14).

Eyes rather large, antennae thick; the details of the nervuration are given in the fig. 13 and 14. Abdomen in our specimen is stretched, and one

can see, thanks to the transparency of 4 last segments, the basal (inner) portion of the ovipositor. Length of the anterior wings 7 mm.; that of the free portion of ovipositor about 4,6 mm.

Jurassic slates near the village Galkino, East Karatau, № 1775/14. A very well preserved specimen.

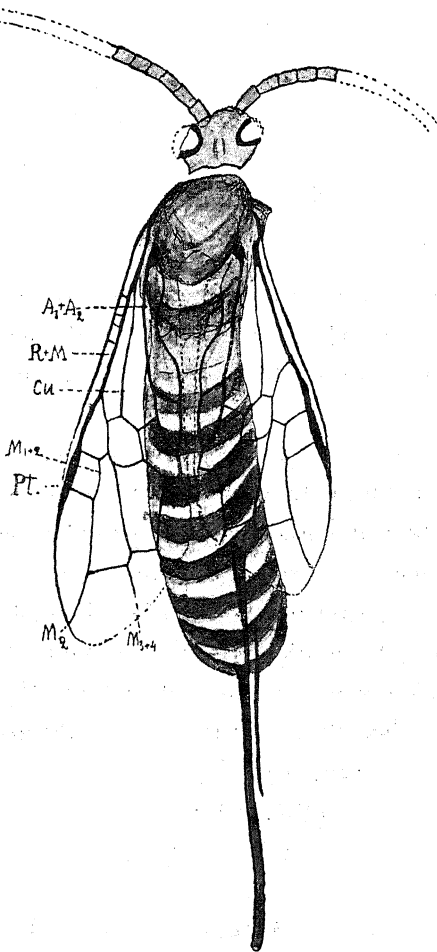


Fig. 13.

The similarity in the nervuration of the wings with *Xyelidae* is not very close. The absence in the anterior wings of *SC* and of  $M_1$ , as some characters in the nervuration of the posterior wings, are features of more advanced specialization, not attained by the recent *Xyelidae*. On the other hand, the antennae in *Anaxyela* are more archaic. In the nervuration of the wings *Anaxyela* resembles also *Xiphidria*, but not closely. Therefore I consider, that our genus represents a wholly extinct family, allied, but not closely, to *Xyelidae*.

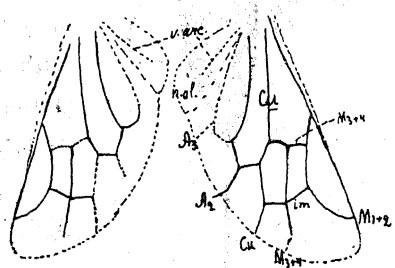


Fig. 14.

### Family Paroryssidae, n. fam.

In the anterior wings *SC* is not wholly fused with *R + M*, but both are bounded by a common dark coloured band; *SC* attains the pterostigma, which is large; costal margin weak; costal vein being very feeble.  $M_{1+2}$  and  $M_{3+4}$  connected in the distal part by two cross-nervules (as in *Cephididae*, for instance);  $M_{1+2}$  connected with *Pt* by one oblique nervule, parallel

to the stem of  $M$ ; this stem is connected with  $Cu$  by two diverging cross-nervules, thus forming a not very great trapezoid cell (=  $M_4$  of the authors);  $A_3$  does not fuse with  $A_1 + A_2$ . In the posterior wings  $M_{1+2}$  and  $M_{3+4}$  united by a short cross-nervule, then diverge.

Ovipositor long, as long as the entire body.

Genus **Paroryssus**, n. gen.

With the features of the family.

**Paroryssus extensus**, n. sp.

(Fig. 15 and 16).

Head and body tenthredinoid, but the details are not distinct; only left antenna preserved, but its annulation is indistinct. Length of the body 5,7 mm.; that with ovipositor 11 mm.; that of the anterior wing about 3,4 mm.

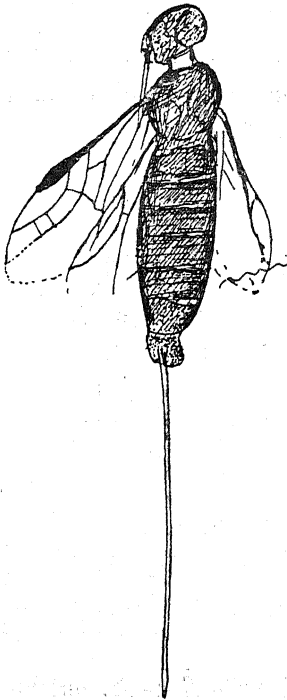


Fig. 15.

In the anterior wings apical portion is great, well developed; pterostigma elliptic;  $SC + R + M$  bounded together and represent a very thick brown stem; costal margin weak; for other details see fig. 16. In the posterior wings  $R + M$  slender, costal margin quite weak, but before the junction of oblique transverse nervule, connecting  $M_{1+2}$  with  $R + M$ , there is a short thickened chitinized stripe;  $M_{3+4}$  diverges from  $M_{1+2}$ ; disposition of remainder veins not quite distinct.

Jurassic slates near Galkino, East Karatau.

№ 1775/15.

By the very thick united stem of  $M + R + SC$ , weakened costal margin, great and long  $Pt$ , by the presence of the free stem of  $M$  and, partly, by the shape of the cell between  $M$  and  $Cu$ , as the absence of the second cross-nervule between  $M_{1+2}$  and the end of  $Pt$  the described genus resembles somewhat the genus *Oryssus*, but differs from it in that the veins of the distal half of

wing are not yet metamorphosed in the dark bands of colour, and  $A_3$  is not fused with  $A_{1+2}$ . The two cross-nervules between  $M_{1+2}$  and  $M_{3+4}$

remind their condition in *Cephiidae*. The nervuration of the posterior wings is not very distinct, but seems to be different enough from that

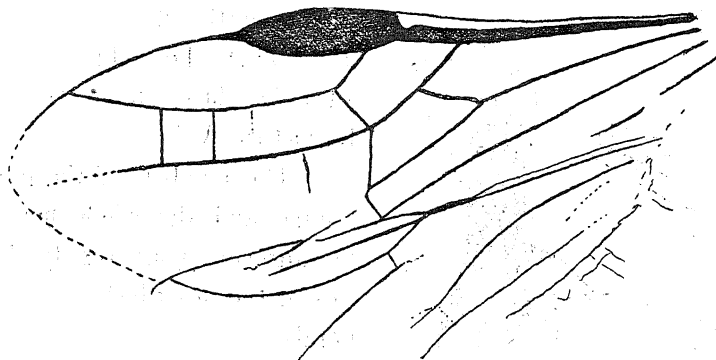


Fig. 16.

in *Oryssidae*. And thus, though our *Paroryssus* somewhat resembles *Oryssidae*, it must be ranked in a separate family, *Paroryssidae*.

Superfamily **Ichneumonodea**.

Family **Evaniidae** Provanch.

Subfamily **Aulacinae** Cameron.

Genus **Mesaulacinus**, n. gen.

Head rather large, rounded, as broad as the thorax (the greater part of the thorax and the abdomen crushed); antennae about 13-jointed, thick; the first and, apparently, the second joint somewhat elongated, the remainder as broad as long. Anterior wings broad, rounded at the apical margin.  $R + M$  thick and not very close to the  $C$ ;  $Pt$  distinct; basal part of  $M_{1+2}$  and cross-nervule between this vein and  $M_{3+4}$  form a triangle; on the middle of  $M_{1+2}$  and on the  $M_{3+4}$ , near the  $m - cu_3$ , one can perceive the disjointed end-portions of still one transverse nervule. The first and second cross-nervules,  $m - cu_1$  and  $m - cu_2$ , long and form a nearly regular rhomb;  $m - cu_3$  is also long. Hind wings not preserved.

**Mesaulacinus oviformis**, n. sp.

(Fig. 17).

Anterior wings very broad, egg-shaped; cell between  $M_{1+2}$  and costal margin rather short, broad; areas between  $M_{1+2}$ ,  $M_{3+4}$  and  $Cu$  also broad; triangle limited by  $M_{3+4}$ , the base of  $M_{1+2}$  and  $im_1$  is nearly regular;

disjointed portions of  $im_2$  directed inwards and somewhat outwards;  $A_{2+3}$ , apparently, is not prolonged after the end of  $Cu$ . Posterior wings invisible; abdomen crushed.

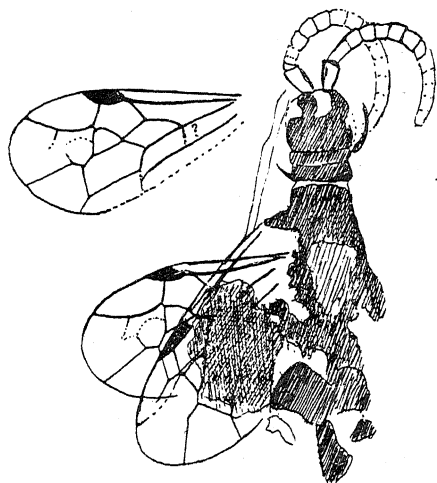


Fig. 17.

Length of the anterior wings 2,1 mm.; their breadth 1,2 mm. Jurassic slates near Galkino, East Karatau, № 1775/16.

The number of the joints of antennae and the whole nervuration of the anterior wings testify close affinities of the described genus to the subfamily *Aulacinae* and, especially, to the genus *Aulacinus* Westwood.

In the homonomous character of the antennal joints *Mesaulacinus* shows some features of primitiveness, but in the nervuration it is not more archaic than the other *Aulacinae*. I think that

this genus can be included in this recent subfamily.

Analogically to the recent *Aulacinae*, *Mesaulacinus* lived, probably, as parasite of *Tenthredinoidea*.

## Superfamily Proctotrypodea Ashm. (Serphidae Kief.).

### Family Heloridae Ashm.

#### Genus Mesohelorus, n. gen.

Head transverse and seems to be broader than the thorax; eyes great, but not very distinct in our specimen; antennae 15-(or 16?) jointed, the joints rather thick and short, only slightly longer than broad; basal joint somewhat bulbous, but not long; the last two seem to be more slender than the remainder ones. Anterior wings subtriangular, pterostigma elongate; stem of  $M$  fractured into three portions. basal portion is perpendicular to  $R + M$ , the second forms the external side of the subtriangular medio-cubital cell<sup>1</sup> and at the end is connected with  $Cu$  by a short cross-vein  $m - cu_2$ ; third portion directed outwards and soon divides into two

<sup>1</sup> = discoidal cell of Kieffer (*Serphidae* in «Das Tierreich», 42 Lief., Berlin, 1914, p. 59).

straight branches,  $M_{1+2}$  and  $M_{3+4}$ , diverging triangularly; between  $M$ ,  $m-cu$ ,  $Cu$  and  $m-cu_2$  there is a nearly triangular cell; cross-nervule  $pt-m_{1+2}$  perpendicular; cross-vein  $cu-a_1$  distinct,  $cu-a_2$  is also present. Membrane clothed with short, but very dense pubescence.

In the abdomen one can discriminate about 5 segments, which are rather similar, uniform; the apex is rounded, with no apical stretching.

**Mesohelorus muchini, n. sp.**

(Fig. 18).

Antennae rather thick; basal joint bulbous, but only slightly longer, than the 3<sup>rd</sup> and 4<sup>th</sup>; 2<sup>nd</sup> joint, probably, shorter than the adjacent one; pterostigma elongate, in the shape of an arrow-head. On the basal parts of  $M_{1+2}$  and  $M_{3+4}$  one can perceive indistinct traces of a disappeared nervule, probably, a cross-nervule between these two branches. Pubescence very dense. Hind wings invisible.

Only the left posterior leg is preserved; tarsal joints were more uniform than in the recent genus *Helorus* Latr., but, unfortunately, two basal joints are not very distinct. Abdomen rounded at the apex.

Length of the body about 5 mm.

Jurassic slates near the village Galkino (belongs to the Geological Committee).

The nervuration of the anterior wings in *Mesohelorus* is very similar to that of the recent genus *Helorus* Latr., differing only by the presence

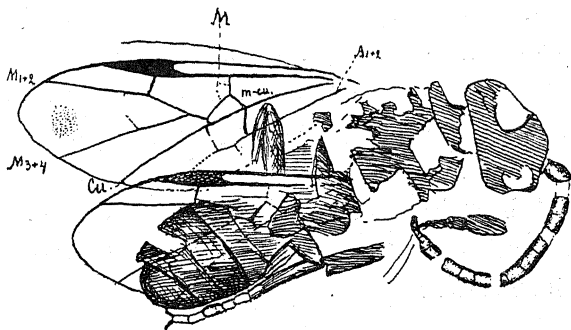


Fig. 18.

of  $m-cu_2$  (in *Helorus* it is reduced to a point) and some other insignificant details. On the other hand, in the uniformity of the antennal joints (except the last two) and, especially, in the shape of abdomen the genus *Mesohelorus* is much more archaic than the recent *Helorus*.



Recent species of *Helorus* are parasites, in the larval phase, on the larvae of *Hemerobiidae*. The just described form was, probably, also a parasite, but on the extinct *Prohemerobiidae*.

### Order Mecoptera.

#### *Orthophlebioides obscurus*, n. sp.

(Fig. 19).

Wings (anterior) broad, with rounded apical margin; anterior margin convex; *SC* long, reaching the level of furcation of the anterior main branch of *RS*; *R* forming a feeble apical fork, limiting the pterostigma; anterior branch of *RS* ( $RS_{1+2}$  of the authors) giving three apical branches, posterior one ( $RS_{3+4}$ ) furcating much earlier; *M* giving  $M_1$ ,  $M_2$ ,  $M_3$  and  $M_4$ ; *Cu* simple, but between it and  $M_4$  one can see a short nervule, which, probably, belongs to *Cu* ( $Cu_1$ ).  $A_1$  —  $A_4$  distinct, simple nervures.

Anterior wings brownish with about 8 transverse dark-brown fasciae, three proximal being short and placed near the hinder (dorsal) margin, the remainder reaching both margins of the wings; 4<sup>th</sup> and 5<sup>th</sup> fasciae conspicuous. Wing clothed with very dense and short pubescence; nervures bear, usually, two rows of longer semi-erect hairs.

Length of the anterior wing 9,5 mm.

Jurassic slates near Galkino (belongs to the Geological Committee).

I think that the described wing is an anterior, what has an affirmation in the well developed fasciae and in the convex anterior margin.

The specimen represents, properly, two wings, the anterior lying upon the posterior, but the nervuration of the hind wing is quite indistinct.

By the broad shape and the nervuration the described wing resembles much those in known species of *Orthophlebioides* Handl. from the Upper Lias of Mecklenburg and differs, chiefly, in that the  $RS_{1+2}$  in our form possesses only three apical branches (on the figures 26—29, pl. XLII of Handlirsch's work we see four branches of  $RS_{1+2}$ ). The presence of well developed fasciae is interesting.

#### *Orthophlebia* (?) *phryganoides*, n. sp.

(Fig. 20).

Anterior wing gradually broadens up to the level of furcation of both main branches of *RS*; apical margin somewhat obliquely truncate, and therefore the general shape of the wing becomes very similar to that of ante-

rior wings in the genus *Phryganea* (s. l.), *Trichoptera*. Subcosta reaching the level of furcation of both main branches of *RS*;  $RS_{1+2}$  giving four branches,  $RS_{3+4}$  furcating nearly at the same level as  $RS_{1+2}$ ; *M* divides at one level with *RS*, but its apical branchings are, unfortunately, indistinct; at the level of the furcation of  $RS_{3+4}$  there is a fork, but I am not sure, that it belongs to the anterior wing; behind the point of dividing of *M* we observe a narrow fork, which, perhaps, does not belong to *Cu*; anales 1—4, as ordinary.

The wing is brownish, with about 9 transverse fasciae, three proximal fasciae are very short and placed, as in foregoing species, near the hinder margin; the fascia № 4 is interrupted in the middle; fascia № 5 conspicuous; № 6 is also conspicuous, but № 7 is interrupted and its hind and more distinct portion is united with the middle of № 6; fascia № 8 of the foregoing species is represented here with two not very distinct apical stripes.

Length of the anterior wing about 17 mm.

Jurassic slates near Galkino, № 1775/17.

The specimen is represented with two pairs of wings, on each side the anterior wing lying upon the posterior. The colour-pattern is conspicuous

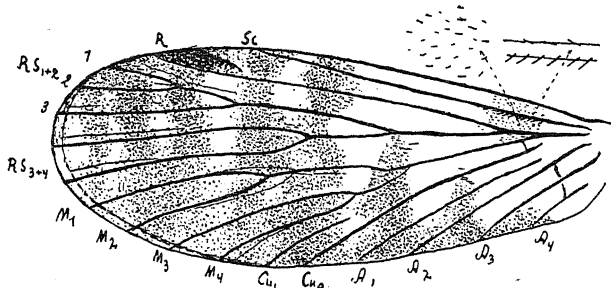


Fig. 19.

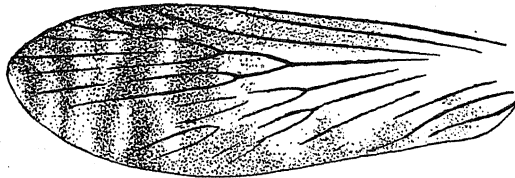


Fig. 20.

enough on both anterior wings, but the just figured nervuration can be discriminate only in one wing; the nervuration of posterior wings indistinct.

The including of the described form in the genus *Orthophlebia* Westw. can be only temporary, as by the shape and, apparently, by the nervuration of its fore wings it differs perceptibly from the species of *Orthophlebia*.

Bibliography, see the Second Part, Bulletin № 12—15, p. 598 in this Bulletin.

### Explanations of the figures.

Fig. 13 and 14. *Anaxyela gracilis*, n. g., n. sp. Abdomen much stretched, thorax not very distinct. 14 — hind-wings; for lettering see the text.

Fig. 15 and 16. *Paroryssus extensus*, n. g., n. sp. 15 — general aspect, 16 — anterior and a part of the posterior wing, more enlarged.

Fig. 17. *Mesaulacinus oviformis*, n. g., n. sp. The body crushed, with only two anterior wings; 17a — restoration of the anterior wing.

Fig. 18. *Mesohelorus muchini*, n. g. n. sp. Thorax and a part of abdomen crushed two anterior wings.

Fig. 19. *Orthophlebioides obscurus*, n. sp. Anterior wing.

Fig. 20. *Orthophlebia* ?) *phryganooides*, n. sp. Anterior wing.

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