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# KEY TO THE GENERA OF EPHEMERIDA.

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## SUBORDERS OF EPHEMERIDA.

A. $Cu_1$ and IA of fore wing diverging very strongly at base; hind tarsus with only four (sometimes fewer) freely movable joints; fifth joint if apparently present closely and immovably united with tibia.
SUBORDER I. EPHEMEROIDEA

AA. $Cu_1$ and IA of fore wing running parallel to each other at base, rarely slightly diverging.

B. Hind tarsus with only four freely movable joints; fifth joint if present closely and immovably united with tibia.
SUBORDER II. BAETOIDEA

BB. Hind tarsus with five freely movable joints.
SUBORDER III. HEPTAGENOIDEA

## Families of Suborder I. EPHEMEROIDEA.

A. Sc of fore wing hidden in a fold of the membrane under R, being invisible at apex but clear only at base; branches of R and M approaching each other in pairs; both wings dull and translucent; legs of female short and weak; tibiae and tarsi of male obliquely banded; only two caudal filaments in male and female; genital appendages 3-jointed (exceptionally with more than two terminal joints), basal joint long.
I. PALINGENIIDAE

AA. Sc of fore wing clear throughout, fully developed.

B. Both wings translucent, in male dull glistening, in female quite dull; no free intercalaries at hind margin of the wing; legs weak, fore legs of male sometimes long, hind legs always short and weak (except in Eucyplocia) II. POLYMITARSIDAE

BB. Both wings transparent and glistening; numerous short free intercalaries at hind margin, especially of the hind wings; legs strong, always functional.

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C. IA of fore wing not forked, but united with margin of the wing by several to numerous cross veins; in the hind wing the inner sectoral fork ($R_2 + R_4$) much longer than its stem, genital appendages with short basal joint, second joint longest
III. EPHEMERIDAE

CC. IA of fore wing forked once; no cross veins at margin of the wing: in the hind wing $R_2 + R_4$ shorter or at most as long as the stem; genital appendages without short basal joint, first joint longest.
IV. POTAMANTHIDAE

Genera of Family I. PALINGENIIDAE

A. M of fore wing forked behind the middle; $Cu_2$ and cubital intercalary arising from $Cu_1$; at least three long intercalaries in the first anal region; fore tarsus of male about 2½ times as long as femur; caudal filaments of female about as long as the body; genital appendages slender, consisting of 6 to 7 joints, the first joint very long, the last 5 to 6 joints short and not so clearly separated from each other.....*Palingenia*

AA. M of fore wing forked before the middle; $Cu_2$ and cubital intercalary arising from IA; only one long intercalary in the first anal region; fore tarsus of male only about as long as femur; caudal filaments of female about ½ as long as the body; genital appendages only 3-jointed, the last two joints short.

B. M of fore wing forked before the sector or at most at the same time with it; Sc and R unclear and hidden at apex; hind leg with only one claw; fore legs of male shorter than hind legs; front of head without forked process; 10th sternite of male short and broad, with deep and arched notch at posterior margin.....*Anagenesia*

BB. M of fore wing forked after the sector; Sc and R clearly visible at the apex though very near; hind leg with two claws, fore leg of male longer and stronger than hind legs; front of head produced into a forked process; 10th sternite of male almost as long as broad, with shallow and arched notch at posterior margin.....*Plethogenesia*

Genera of Family II. POLYMITARCIDAE.

A. M of fore wing forked near base and before radial sector; two long simple intercalaries in the 1st anal region.

B. Pronotum very short, ring-like, not broader behind than in front; fore leg of male almost as long as the body; genital appendages stout.

C. The two long intercalaries in the 1st anal region arising together from IA; penial lobes curved like claws.....*Asthenopus*

CC. One of the two intercalaries in the 1st anal region arising from IA, the other one arising on the other side from 2A; penial lobes straight, rod-like .....*Povilla*

BB. Pronotum longer, almost as long as broad, much broader behind than in front; fore leg of male about half as long as body, much shorter than the abdomen; the two long intercalaries in the lst anal region running into IA near each other or even together; genital appendages very slender and long, penial lobes hooklike or claw-like ..... ..... *Campsurus*

AA. M of fore wing forked at most at the end of the first fourth and behind (or at the same time with) the sector.

B. Two to nine intercalaries in the lst anal region of the fore wing united with each other by numerous cross veins and converging toward the base; no S-formed cross vein from IA or the last intercalary to the wing margin; pronotum somewhat broader than long; fore leg of male about as long as body, the other legs short and weak; genital appendages 4-jointed.....*Polymitarcys*

BB. None or at most one to three intercalaries in the lst anal region of the wing; these when present united with each other by numerous cross veins; several to numerous S-formed cross veins running to the wing margin from IA (when no intercalaries present) or from the last intercalary.

C. Pronotum at least as long as broad behind; hind wings small, elongate oval, venation reduced, R not arising from base of the wing but from the sector at the end of the first third, M and Cu not forked; fore leg of male short, only about as long as the head and thorax together, that of the female still more delicate; hind legs very weak; male with only two caudal filaments..... ..... *Exeuthyplocia*

CC. Pronotum much broader than long; hind wings broader, with normal R, at least M being forked; fore leg of male about as long as the whole body, the other legs also well developed and long; male and female with three caudal filaments.....*Euthyplocia*

Genera of Family III. EPHEMERIDAE.

A. Only two long caudal filaments.

B. Male specimen.

C. Fore leg of male almost as long as body (at least two thirds as long), tarsus about 1.2/3 to 1.3/5 as long as femur.

D. Genital appendages with only one short terminal joint (i.e. only 3-jointed).....*Eatonica*

DD. Genital appendages with two short terminal joints (i.e. 4-jointed).

E. Genital appendages attached to a large, almost quadrangular plate (10th sternite), which being longer than the basal joint of the appendages; inner claw of the fore leg hooked..... .....*Ichthybotus*

EE. Genital appendages attached to a broad rectangular plate, which being at most as long as the basal joint of the appendages; both claws of fore leg blunt; penial lobes hooked ..... ..... *Hexagenia*

CC. Fore leg of male about half as long as the body; tarsus hardly as long as femur; penial lobes almost straight..... ..... *Pentagenia*

BB. Female specimen; pronotum longer than broad; fore tarsus as long as tibia..... *Hexagenia*

AA. Three long caudal filaments.

B. Male specimen; fore tibia 2½ to 3 times as long as femur, tarsus about 4 times as long as femur..... *Ephemera*

BB. Female Specimen:

C. Pronotum longer than broad..... *Eatonica*

CC. Pronotum shorter than broad.

D. In New Zealand..... *Ichthybotus*

DD. Not in New Zealand.

E. Fore wing shorter and broader than Pantagenia; a series of cross veins between 3A and wing margin; in the hind wing the second branch of M (almost without exception) running into Cu; anal region of hind wings weakly developed..... ..... *Ephemera*

EE. Fore wing longer and narrower; only a few (2 to 3) cross veins between 3A and wing margin; in the hind wing the second branch of M normally running into the first branch; anal region of hind wings well developed..... *Pentagenia*

Genera of Family IV POTAMANTHIDAE.

A. Only two long caudal filaments (male and female); in the fore leg of the male one claw pointed, the other blunt; fore tarsus of male only 4/5 as long as femur..... *Rhoënanthus*

AA. Three long caudal filaments (male and female); in the fore leg both claws blunt; fore tarsus of male about as long as femur.

B. R of hind wing normal..... *Potamanthus*

BB. R of hind wing abnormal at base, $R_1$ and $R_s$ arising at right angle from base of radial stem and running parallel to each other..... ..... *Potamanthoides*

Families of Suborder II. BAËTOIDEA.

A. Sc of fore wing fully visible, well developed, entirely separated from R.

B. M of fore wing clearly forked.

C. Wings clear; hind wings present, very rarely wanting; wings with numerous cross veins.

D. IA of fore wing usually separated from 2A at base, 2A close to 3A; no free intercalaries between $Cu_2$ and IA, also none between the long intercalary and $Cu_2$; genital appendages (almost without exception) with 2 short terminal joints, the first one being longer.....V. LEPTOPHLEBIIDAE

DD. IA of fore wing close to 2A, 2A separated from 3A; several (usually two) free intercalaries between $Cu_2$ and IA, also between the long intercalary and $Cu_2$ (i.e. the inner half of the cubital fork); genital appendages with only one short terminal joint, the antipenultimate one being longer.

VI. EPHEMERELLIDAE

CC. Wings milky or darkly tinged, fringed at the posterior margin, hind wings wanting (sometimes present only in the subimago); no free intercalaries, often with only a few cross veins; small species. VII. CAENIDAE (X. PROSOPISTOMATIDAE)

BB. M of fore wing not forked; $M_1$ therefore simple; 2 free intercalaries behind $M_1$, the second one corresponding to $M_2$ but not arising from $M_1$; fore wing usually with only a few cross veins; hind wing very small and narrow, with only 2 to 3 longitudinal veins and usually a few cross veins, or entirely wanting; wings clear.

VIII. BAETIDAE

AA. Sc of fore wing not clear (or at most clear at the base), united with R or entirely wanting; wings milky or grayish tinged with very simple venation; fore wing with 4 to 7 longitudinal veins, with cross veins at most in the first 2 to 5 anterior fields (cells), hind wing without or with very few cross veins in the basal part; large and medium species.

IX. OLIGONEURIIDAE

## Genera of Family V. LEPTOPHLEBIIDAE

A. Hind wings present, sometimes small.

B. Claws all similar, narrow and hook-like.

C. Hind wings more or less broad oval, anterior margin convex, without prominent process; the crest of the arch lying before the middle, behind this crest the margin somewhat concave, the deepest point of this concavity being far in front of the end of Sc; Sc long, costal region long and narrow, the subcostal region broader than costal region; genital appendages 3-jointed, basal joint much longer than the two terminal joints together; 10th sternite not split into plates..... *Atalophlebia*

CC. Hind wings more obliquely rectangular, anterior margin with prominent blunt process before or at the middle; behind this process the costal margin changing into a flat concave arch, reaching the end of R, the deepest point of the concavity lying

at the end of Sc; Sc short, costal region short and broad, subcostal region narrower or at most as broad as the costal region, genital appendages and 10th sternite same as Atalophlebia, the second terminal joint of the genital appendages sometimes wanting..... *Adenophlebia*

BB. Claws dissimilar, one blunt, the other pointed.

C. Hind wing obtuse oval, costal region narrow, long.

D. Median caudal filament as long as or longer than the lateral ones.

E. 10th sternite of the male consisting of an undivided plate; abdomen with dark marks, otherwise same as Leptophlebia. ..... *Deliatidium*

EE. 10th sternite of the male splitting into two plates, each representing the base of a genital appendage; abdomen without dark marks.

F. Penial lobes each with a suspending thin fishbone-like appendage near the apex, apex rounded or with hooks; costal margin of hind wing weak and irregularly arched, because the bending being strong at both ends but interrupted in the middle by a shallow indentation; cross veins numerous in the fore wing; genital appendages 3-jointed, basal joint much longer than the two terminal joints together..... *Leptophlebia*

FF. Penial lobes with the above mentioned thin and suspending appendage, also with a large or small usually bluntly triangular process, it being directed to the side and lying in front of the apex; otherwise same as Leptophlebia..... *Paraleptophlebia*

DD. Median caudal filament much shorter than the lateral ones, otherwise same as Leptophlebia..... *Blasturus*

CC. Hind wing angularly broken at costal margin, costal region broad and usually greatly shortened, rarely long.

D. 1A and 2A of fore wing united with each other, at base (with a common stem) or almost united; hind wing with strong, often hook-like projection on the costal margin, Sc very short; genital appendages 3-jointed, the basal joint longer than the two terminal joints together; last sternite of male not divided; female sometimes with ovipositor..... *Hagenulus*

DD. 1A and 2A of fore wing separated from each other; hind wing with blunt, never hook-like projection on costal margin.

E. M of hind wing forked; Sc only slightly shortened and reaching out over the projection of the costa, usually to about the middle between this projection and the end of the radius;

genital appendages 3-jointed, basal joint much longer than the two terminal joints together; penis divided into two broad lobes, each lobe with an inward and upward directed thin appendage; last sternite not divided; its dorsal marginal lamella projecting far out in the middle. .*Thraulodes*

EE. M of hind wing not forked.

F. Sc of hind wing reaching almost to the apex, therefore long, genital appendages always 3-jointed, basal joint usually with a ring-like constriction at base.

G. Basal joint of genital appendages hardly as long as the two terminal joints together; last sternite divided into two plates ..... *Habrophlebia*

GG. Basal joint of genital appendages much longer than the two terminal joints together, last sternite undivided but with two somewhat parallel short finger-like processes in the middle of the hind margin ..... *Calliarcys*

FF. Sc of hind wing ending right behind the projection of the costa, being therefore greatly shortened; genital appendages 3 or 4 jointed.

G. Last sternite of male divided into two triangular plates; Sc of hind wing ending opposite to the projection, being therefore greatly shortened; genital appendages 3-jointed, basal joint much longer than the two terminal joints together, with a ring-like constriction at base; penial lobes close to each other, narrow, each lobe with a down-hanging appendage..... *Habrophlebiodes*

GG. Last sternite of male not divided into plates.

H. Genital appendages distinctly 4-jointed, the short basal joint ring-like, the second joint much longer than the two terminal joints together; Sc of hind wing ending right behind the projection at the innermost part of the costa; penis quite small, divided into two long contiguous lobes, without appendages; last sternite undivided, short, somewhat produced in the middle of the hind margin. ..... *Chorterpes*

HH. Genital appendages 3-jointed, without a short ring-like basal joint, otherwise same as Chorterpes; Sc of hind wing still more shortened, ending opposite to the projection; penis divided into two lobes, each lobe usually with a thin down-hanging

appendage; last sternite not divided, dorsal marginal lamella sometimes projecting far out on each side.....*Thraulus*

AA. Hind wings entirely wanting.

B. Fore wing long and narrow, usually with thick net-work of cross veins; genital appendages only 2-jointed, a long basal joint and a much shortened terminal joint; last sternite not divided; penial lobes very narrow and rod-like, fore-tarsus of male as long as tibia .....*Hagenulodes*

BB. Fore wing somewhat broader, with fewer close-set cross veins; genital appendages 3-jointed, basal joint much longer than the two terminal joints together; last sternite not divided; penial lobes rod-like but broader; fore tarsus only about two thirds as long as the tibia; female with ovipositor.....*Hagenulopsis*

Genera of Family VI. EPHEMERELLIDAE.

A. Median caudal filament long; hind wings with well developed veins, Sc long and arched; basal joint of genital appendages much shorter than second joint.

B. 1A and $Cu_2$ of fore wing entirely (up to the base) separated from each other.

C. Fore-wing comparatively broad; the short free intercalaries at wing margin mostly grouped in threes; hind wings comparatively small, region of the sector occupying about two thirds of the wing, the medial cubital and anal regions only about one third; M not distinctly forked; both wings black.....*Melanemerella*

CC. Fore wing much narrower, the short free intercalaries arranged singly; hind wings comparatively larger, region of the sector occupying only about half the width of the wing; wings not dark.

D. Hind femora and tarsi subequal in length, hind tibia only somewhat longer than tarsus; second joint of genital appendages enlarged at tip into a thicker quadrangular part; penial lobes ending with long spur-like process.....*Chitonophora*

DD. Hind tibia much longer than femora and about twice as long as tarsi; second joint of genital appendages not enlarged at tip; penial lobes without spur-like process.....*Ephemerella.*

BB. IA and $Cu_2$ of fore wing united toward the base (at the cross vein) thus appearing to arise from a common stem, otherwise same as Ephemerella. .....*Drunella*

AA. Median caudal filament wanting; hind wings small and with poorly developed veins, Sc short and straight; basal joint of genital appendages longer than second joint.....*Teloganodes*

Genera of Family VII CAENIDAE.

A. $Cu_2$ and cubital intercalary of fore wing as long as $Cu_1$, both therefore running up to the base; in IA region the two intercalaries forming a very

long narrow fork; 2A and 3A forming a similar fork; cross veins of wings arranged singly, no intercalary region with more than one cross vein, only radial region with 2 to at most 3 cross veins; wings broad, anal field broadened toward the body, broadly spread out; male and female with 3 caudal filaments; genital appendages 1-jointed, slender, pointed; penis broad, plate-like, undivided; 10th sternite undivided.

B. Prosternum very narrow, 2 to 3 times longer than broad, the fore coxae therefore closely approximate; second antennal joint not lengthened ..... *Caenis*

BB. Prosternum very broad, twice as broad as long, the fore coxae therefore widely separated apart; second antennal joint 3 times as long as first joint ..... *Eurycaenis*

AA. $Cu_2$ and cubital intercalary much shorter than $Cu_1$ in fore wing, not extending up to the base; in IA region the two intercalaries forming a short and broad fork or separated from each other; 2A and 3A strongly curved and running parallel, usually unforked; cross veins of wings not arranged singly, but much more numerous, almost all intercalary spaces with several to many cross veins; wing form varying; always three caudal filaments; genital appendages two to three jointed; penis more slender, often deeply split or divided; 10th sternite undivided.

B. Fore wings comparatively narrow, broadest at the cubital region.

C. Legs short, hind legs somewhat longer than fore legs..... ..... *Leptohyphes*

CC. Legs longer and thinner, fore legs of male about as long as body, hind legs almost equally long, in female hind legs almost as long as body ..... *Leptohyphodes*

BB. Fore wings comparatively broader, more so than in Caenis, broadest in the anal region.

C. Legs short as in Leptohyphes, half as long as body..... ..... *Tricorythus*

CC. Legs longer and thinner, as in Leptohyphodes. *Tricorythodes*

## Genera of Family VIII. BAËTIDAE.

A. Hind wings wanting.

B. Short free intercalaries arranged singly on outer margin of wings.

C. First cross vein between R and upper branch of sector meeting the latter distinctly basad of the cross vein in the following intercalary space..... *Cloëon*

CC. First cross vein between R and upper branch of sector meeting the latter at or distad of the cross vein in the following intercalary space ..... *Procloëon*

BB. Intercalary veins arranged in pairs..... *Pseudocloëon*

AA. Hind wings present, though sometimes very tiny.

B. Fore wing with numerous cross veins in basal half of costal region; hind wing with blunt process, with cross veins at least in the costal region ..... *Callibaëtis*

BB. Fore wing without cross veins in basal half of costal region, hind wing without cross veins in costal region.

C. Intercalary veins of fore wings arranged singly.

D. Hind wing very long and narrow, with long pointed process on costal margin, with at most 2 longitudinal veins, without cross veins ..... *Centroptilum*

DD. Hind wing comparatively broad, with pointed process on costal margin, distad of which a second more blunt process, with three long longitudinal veins, the middle one of which forked..... ..... *Centroptiloides*

CC. Intercalary veins of fore wings arranged in pairs.

D. Hind wing very small and narrow, without process on costal margin, with only 2 simple longitudinal veins..... ..... *Acentrella*

DD. Hind wing oval-shaped, with sharply or bluntly pointed process on costal margin, with 2 or at most 3 longitudinal veins, the second one sometimes forked ..... *Baëtis*

Genera of Family IX OLIGONEURIIDAE.

A. With only 2 caudal filaments.

B. Three long strong longitudinal veins running up to the base between R and anal vein in the fore wing; $R_s$ (the second one of these longitudinal veins) running up to the base; Cu with very long fork, anal veins also forked; several to many cross veins in costal region, 3 to 4 in radial region, 2 in the following region; genital appendages 2-jointed, the basal joint very long, the terminal joint short. *Spaniophlebia*

BB. Only two longitudinal veins running up to the base between R and anal vein in the fore wing; $R_s$ arising behind the middle of R, and forming a fork with it; Cu with shorter fork (or with shorter longitudinal vein instead); anal veins also forked.

C. Only one row of 3 cross veins in the fore wing, only one single cross vein in each region; genital appendages 2-jointed, the basal joint very long, the terminal joint short; penis divided into 2 broad triangular lobes..... *Lachlania*

CC. More numerous cross veins in the fore wing, several cross veins in each region; genital appendages and penis same as Lachlania. ..... *Noya*

AA. With three caudal filaments.

B. Only 2 strong longitudinal veins between R and anal vein in the fore wing, either both running up to the base or the lower one arising from the upper one as a shortened branch.

C. Both longitudinal veins between R and anal veins running up to the base; anal veins undivided; without cross veins in radial region; no indistinct longitudinal and cross veins between anal vein and preceeding longitudinal vein (Cu?). *Homoeoneuria*

CC. Of the 2 longitudinal veins between R and anal vein only the first one running to the base, the second one being a branch of the first, arising shortly before the middle of the wing; a long indistinct (weak) longitudinal vein between this forked vein and the anal vein running into the first strong longitudinal vein at base, numerous very indistinct cross veins, anal veins forked; genital appendages 3-jointed, basal joint very long, the 2 terminal joints very short, penis split into 2 blunt triangular lobes..... ..... *Elassoneuria*

BB. Three strong longitudinal veins between R and anal vein of the fore wing, either all three running up to the base or the first one appearing as a shortened branch (sector) of the R; anal veins forked; Cu sometimes with long and very weakly marked branch; several rows of cross veins in front part of the wings; genital appendages 3-jointed, basal joint very long, the two terminal joints short (sometimes with 3 short terminal joints)..... *Oligoneuria*

Genus of Family X. PROSOPISTOMATIDAE.

Only one genus, Prosopistoma; imaginal-stadium still fully unknown; only the very characteristic broad nymph well known, the sub-imago extremely rare; classification being therefore impossible; sub-imago similar to Caenis in certain respects, but wings with numerous longitudinal veins.

Families of Suborder III. HEPTAGENIOIDEA.

A. IA region of fore wing very narrow, not broadend at apex, IA, 2A and 3A somewhat parallel to each other and equal in length; 1A region without paired or S-formed intercalaries, but with cross veins between IA and 2A; S-formed or straight and sometimes divided vein extending from 3A to wing margin; hind wing almost circular, with very numerous long intercalaries in cubital and anal fields; pronotum very small
XI. BAETISCIDAE

AA. IA region of fore wing narrow only at base, distinctly broadening toward apex, 2A much shorter and more strongly curved than IA; only 2A and 3A parallel to each other; hind wing not circular but more or less oval.

B. IA region of fore wing with several to many curved S-formed intercalaries, extending from IA to wing margin, some being forked,

sometimes with shorter free intercalaries between the attached ones; pronotum well developed. . . . . XII. SIPHLONURIDAE

C. IA region of fore wing with only a pair of intercalaries; sometimes with indication of a second pair of intercalaries, which then being very short and lying near 2A (i. e. the reverse of Ecdyonuridae). . . XIII. AMETROPODIDAE

CC. IA region of fore wing with 2 pairs of long intercalaries, the longer pair always lying near to 2A; with 2 caudal filaments. . . . . XIV. ECDYONURIDAE

Genus of Family XI. BAETISCIDAE.

Only one genus, Baetisca.

Genera of Family XII. SIPHLONURIDAE.

A. Hind tarsus shorter or at most as long as tibia; fore tarsus of male varying in length.

B. Cubital intercalary in fore wing unusually short.

C. IA of fore wing parallel to 2A at base; cross veins of pterostigma region united with each other so as to form a thick net-work, whose cells are arranged in two rows one behind the other; penis far extended, with long fork-like branches. . . . . *Chimura*

CC. IA running into 2A at base; cross veins in pterostigmal region not so thickly reticulate, whose cells not forming two rows. . . . . *Andromina*

BB. Cubital intercalary in fore wing normal, very long.

C. Claws of all tarsi different.

D. Median caudal filament rudimentary but distinctly jointed; fore tarsus of male about as long as tibia, tibia about 1.5/8 to 1.3/4 as long as femur; hind tarsus of male about 5/12 as long as tibia; fore tarsus of female about 3/8 as long as tibia; 10th sternite of male split almost up to the base, that of the female very deeply notched at hind margin; second joint of genital appendages shorter than the 2 terminal joints together. *Coloburiscus*

DD. Median caudal filament entirely wanting; fore tarsus of male about twice as long as tibia, tibia about 9/10 as long as femur; hind tarsus of male almost as long as tibia; fore tarsus of female almost exactly as long as tibia; 10th sternite of male forming a broad plate, roundedly or angularly notched at hind margin, that of the female bluntly triangular, angularly notched at hind margin; 2nd joint of genital appendages longer than the two terminal joints together. . . . . *Ameletus*

CC. Hind tarsi and usually also the fore tarsi with similar pointed claws.

D. Anal region of hind wing narrow, 2A unbranched; fore tarsus of male at least twice as long as tibia, tibia almost 1.1/8 as

long as femur; hind tarsus of male about $\frac{3}{4}$ as long as tibia; 10th sternite of male angularly and broadly notched; 2nd joint of genital appendages longer than the two terminal joints together; median caudal filament very short, about 1/8 as long as the lateral ones.....*Metamonius*

DD. Anal region broad in hind wing, 2A with many branches.

E. Fore tarsus of male hardly longer than tibia, claws of fore legs not pointed but similar to each other; fore tibia of female much longer than femur; 10th sternite of male split almost to the base thus consisting of two separate lateral plates; the two terminal joints of genital appendages short, being about $\frac{3}{4}$ as long as the 2nd joint; 10th sternite of female not split; median caudal filament entirely wanting or usually tiny ..... ..*Chirotonetes*

EE. Fore tarsus of male at least twice as long as tibia, claws of fore legs pointed; fore tibia of male about $\frac{3}{4}$ as long as femur.

F. Abdominal segments 5-9 with flat broad processes on sides; 10th sternite of male undivided, deeply obtusely notched on hind margin; median caudal filament tiny .....*Siphlonisca*

FF. Abdominal segments without flat broad processes; 10th sternite of male not split, forming a quadrangular plate, its hind margin projecting somewhat between the genital appendages; 2nd joint of genital appendages longer than the two terminal joints together; median caudal filament very short, with 5 joints.....*Sparrea*

AA. Hind tarsus longer than tibia; fore tarsus of male at least twice as long as tibia.

B. Claws all similar, narrow, hooked; abdominal segments not broadened sidewise.

C. Hind wing shoe-shaped, with concave hind margin and reduced venation; fore wing unusually long and narrow; 10th sternite of male not divided, broadly and angularly notched at middle of hind margin; genital appendages 4-jointed, the two terminal joints together hardly half as long as the 2nd joint; median caudal filament at least half as long as the lateral ones (at least as long as the body).....*Dipteromimus*

CC. Hind wing normal in form (somewhat oval) and with normal venation.

D. Median caudal filament tiny; 10th sternite of male not split, forming a quadrangular plate, its hind margin projecting between the genital appendages; genital appendages 4-jointed, 2nd joint longest.....*Siphlonurus*

DD. Median caudal filament distinctly developed, though only as long as fore tibia; 10th sternite of male crenate almost to base, thus consisting of two separate lateral pieces; genital appendages 4-jointed, 2nd joint many times (often) longer than the 2 very short terminal joints together .....*Siphluriscus*

BB. Claws dissimilar in the pairs; abdominal segments 5-9 with flat broad processes on sides; 10th sternite of male split into two separate rectangular lateral plates; genital appendages 4-jointed, the 2nd joint longest, longer than the two terminal joints together; 10th sternite of female not divided; median caudal filament distinct, about ¼ as long as body in male, about 1/6 as long as body in female. .*Oniscigaster*

Genera of Family XIII. AMETROPODIDAE.

A. Median caudal filament very rudimentary, with only very few joints; fore tarsus of male about 5 times as long as tibia; hind tarsus of male more than 1½ times as long as tibia; fore tarsus of female about 2.2/3 as long as tibia; median fork of hind wing about as long as its stem; costal process angular; 10th sternite of female deeply roundedly notched on hind margin between the genital appendages; genital appendages 4-jointed, the basal joint almost 2/3 as long as the second, 2nd joint longest, the 2 terminal joints together only about as long as the basal joint..*Ametropus*

AA. Median caudal filament as long as the lateral ones; fore tarsus of male about 2½ to 3 times as long as tibia; hind tarsus of male as long as or (in other species) 1½ to 2 times as long as tibia; fore tarsus of female 1.1/3 as long as tibia; in the hind wing the median fork very long, several times longer than its stem; costal process same as Ametropus; 10th sternite of male similarls but less deeply notched; genital appendages 4-jointed, basal joint very short, 2nd joint very long, basal joint distinctly shorter than the 2 terminal joints together..... *Metretopus*

Genera of Family XIV. ECDYONURIDAE.

A. Only comparatively few (thickened) cross veins in the fore wing, arranged in the disk in four broad adjacent transverse rows; hind wing with four longitudinal veins behind median fork; (fore legs of male unknown); hind tarsus of male almost as long as tibia; 10th sternite of male slightly convex at hind margin; genital appendages and penis similar to those of Heptagenia..... *Compsoneuria*

AA. Cross veins normal in number in the fore wing, thus forming a more or less thick network of cells.

B. Hind wing narrow and small, with very weakly developed cubital and anal regions, with only two longitudinal veins behind the median fork; fore tarsus of male almost 1½ times as long as tibia; hind tarsus of male about 1/3 as long as tibia; 10th sternite of male weakly notched on hind margin; genital appendages and penis similar to those of Rhithrogena..... *Bleptus*

BB. Hind wing normally developed, with at least 4 longitudinal veins and also cross veins behind the median fork, cubitus (mostly) divided.

C. Hind tarsus of male distinctly longer (1.1/3 to 2 times) than the tibia; hind tarsus of female also longer than the tibia; first tarsal joint of hind leg distinctly lengthened, about as long as the other 4 joints together and about as long as the tibia (male) or only slight slightly shorter (female); caudal filaments about twice as long as the body; 10th sternite of male short, deeply notched on hind margin, somewhat convex at middle, lateral pieces projecting; genital appendages 4-jointed, 2nd joint much longer than the 2 terminal joints together; penial lobes roundly broadened at apex, titillators distinct . . . . . *Atopopus*

CC. Hind tarsus (male and female) never longer than tibia, usually much shorter (only in Thalerosphyrus male being just as long); first tarsal joint of hind leg not considerably lengthened, very little different in length from the 2nd joint (either somewhat longer, or just as long, or somewhat shorter), and at most 1/3 as long as the tibia (in Thalerosphyrus), usually much shorter.

D. First tarsal joint shorter than the 2nd.

E. Caudal filaments of male and female about 3 times as long as the body; hind wings comparatively small, very narrow toward apex, cubital and anal regions weakly devloped; 10th sternite of male notched on hind margin between the genital appendages and distinctly separated from the projecting lateral parts on which the genital appendages being attached, the notch itself being convex; penis entirely cleft, the lobes being widely separated from each other, cylindrical, broadened into club-form at apex, titillators strong, blunt; genital appendages 4-jointed, 2nd joint much longer than the 2 terminal joints together; 1st joint of fore tarsus in male about 1/3 as long as 2nd, legs slender. . . . . *Paegniodes*

EE. Caudal filaments of male and female about 1½ (usually 2) times as long as the body; hind wings normal, more blunt toward apex, cubital region fairly well developed; 10th sternite of male rarely truncate on hind margin between genital appendages; mostly somewhat projecting but somewhat sunken in the middle, not strongly separted from the lateral pieces, which are not projecting; penis broad, the lobes close together, flat or somewhat hollowed out on ventral side, apex blunt, rarely with projecting angle; titillator distinct, pointed, usually united in the median line; genital appendages and legs similar to Paegniodes; 1st joint of fore tarsus of male about 1/6 to ½ as long as the 2nd . . . . *Heptagenia*

DD. First joint as long as or longer than the 2nd.

E. Hind tarsus as long as or hardly noticeably shorter that tibia.

F. Fore tarsus of male about 1½ as long as tibia, tarsal joints 1 to 4 about similar in length, 5th joint half as long as the 4th; in the hind tarsus of male the lst joint about 1½ times as long as the 2nd and not quite 1/3 as long as the tibia; caudal filaments about 4½ times as long as body, in female about 3 times as long; 10th sternite of male with straight or weakly convex broad notch in the middle of hind margin, which is bounded on each side by a bluntly rounded elevation; genital appendages 4-jointed, lst joint very short, the two terminal joints together being only about half as long as the 2nd; penis only incised, not deeply split, the lobes being long and rectangular, slightly broadened at apex; in the female the 10th sternite large, broadly produced, somewhat semi-elliptical..... ..... *Thalerosphyrus*

FF. Fore tarsus of male twice as long as tibia; tarsal joints same as Thalerosphyrus; in the hind tarsus lst joint twice as long as 2nd; caudal filaments of male twice as long as the body, in the female only slightly longer than the body, in the female only slightly longer than the body; 10th sternite of male truncate behind and produced in the middle into two short broad teeth (whether same as preceeding form ?); genital appendages 5-jointed, lst joint short, the 3 terminal joints together being only half as long as the 2nd; penial lobes short and broad, almost triangular, with distinctly pointed stimuli..... *Arthroplea*

EE. Hind tarsus much shorter (1/3 to at most ½ as long) than the tibia.

F. In the fore tarsus of male lst joint longer than the others.

G. In the hind tarsus lst joint longer than the 2nd, joints 1 to 4 gradually decreasing in length, 5th joint the longest; fore tarsus of male about 1. 1/6 as long as tibia, tibia about 1¼ as long as femur; fore tarsus of female about ¾ as long as tibia, tibia about 12/13 as long as femur; caudal appendages of male about 3 times as long as body, that of female 2½ to 3 times as long; 10th sternite of male deeply and broadly notched on hind margin, thus consisting of two diverging projecting lateral pieces, which bear the genital appendages; genital appendages 4-jointed, the 2 terminal joints together being almost as long as the long 2nd joint; penis divided up to the middle by a triangular notch, the lobes being robust, broadened outward at apex; 10th sternite of female straightly notched on hind

margin; in the male the claws of fore legs similar, blunt, dissimilar in the other legs and in the female. ..... *Epeorus*

GG. In the hind tarsus 1st joint not longer than the 2nd, joints 1 to 3 being somewhat similar in length, 4th joint shorter, 5th longest; fore tarsus of male about 1.1/3 to 1½ times as long as tibia, tibia about 1½ to 2 times as long as femur; fore tarsus of female about 2/3 as long as tibia, tibia about 1.1/10 as long as femur; caudal filaments of male about 4 times as long as body, those of female about twice as long; 10th sternite of male projecting in the middle of the hind margin between the genital appendages, convex; genital appendages 4-jointed, the 2 terminal joints together almost as long as the long 2nd joint; penial lobes not thickened at end; 10th sternite of female weakly notched on hind margin; claws dissimilar in male and female..... *Iron*

FF. In the fore tarsus of male 1st joint shorter than several of the following joints.

G. First joint of fore tarsus in male shorter than the 5th; fore tarsus of male about 1.2/3 as long as tibia, tibia about 1¼ as long as femur; 1st joint about 1/5 as long as the second; fore tarsus of female slightly more than half as long as tibia, tibia almost 1¼ as long as femur, 1st joint about half as long as the 2nd; in the hind tarsus 1st joint same as 2nd and slightly longer than the 3rd; 10th sternite of male usually concave in the middle of hind margin between the genital appendages, rarely somewhat convexly produced; genital appendages 4-jointed, the 2 terminal joints together shorter than the long 2nd joint; penial lobes entirely separated from each other, thus forming narrow pieces, usually somewhat broadened at apex, rarely somewhat lancet-like broadened; titillators lying close to the lobes; 10th sternite of female bluntly rounded or somewhat crenate on hind margin.... *Rhithrogena*

GG. First joint of fore tarsus in male longer than the 5th.

H. First joint of fore tarsus in male about 2/3 as long as 2nd, 2nd slightly shorter than 3rd; fore tarsus of male about 1.4/5 as long as tibia, tibia hardly longer than femur; fore tarsus of female about ¾ as long as tibia, tibia about as long as femur; hind tarsus about half as long as tibia,

tibia about 8/9 as long as femur; tarsal joints of hind leg decreasing in length from 5th, lst, 2nd, 3rd to 4th, lst joint usually hardly larger than 2nd; 10th sternite of male slightly convex on hind margin between the genital appendages or with projecting lateral pieces (usually same as Epeorus); genital appendages 4-jointed, the 2 terminal joints together about as long as the 2nd; penial lobes entirely separated from each other, similar to Rhithrogena; claws dissimilar.....*Cinygma*

HH. First joint of fore tarsus in male usually about half as long as 2nd, rarely longer or shorter; 2nd joint usually somewhet longer than 3rd; otherwise the measurements of the legs about the same as Cinygma; claws also similar; 10th sternite of male slightly convex in the middle of hind margin and the arch separated by a blunt process from the non-projecting lateral pieces on which the genital appendages are carried; genital appendages 4-jointed, the 2 terminal joints together being much shorter than the 2nd either strongly broadened sidewise at apex or only thickened at apex .....*Ecdyonurus*