

*Dixa* is the most generalized form and is a surface feeder, taking small vegetable particles by the rapid motion of its mouth parts. The air tube is well developed, but sessile, and there are false abdominal feet to assist the larva in ascending the water film at the margin, as is its habit. From *Dixa* can be derived not only all the other Corethridæ, but the Culicidæ as well. *Anopheles*, for example, is very close to *Dixa* in many characters.

Except *Dixa*, all the Corethridæ are predaceous, feeding largely on the larvæ of the true mosquitoes. Next to *Dixa* comes *Eucorethra*, with its air tube still sessile, but the mouth parts modified for its predaceous habits. It is still nearly a surface feeder, lying flatly in the water. *Corethrella* is a fur-

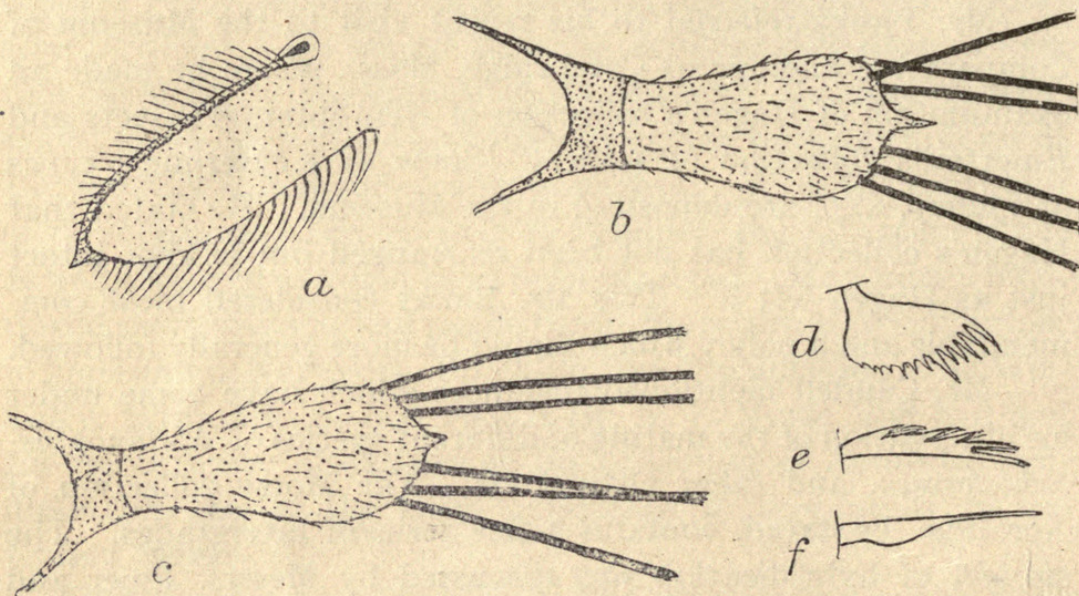


FIG. 2.—Structural details of North American Corethrid larvæ: *a*, ciliated plate of air tube in *Dixa recens*; *b*, anal segment of *Dixa recens*; *c*, the same of *D. centralis*; *d*, leaf-like appendage of *Sayomyia americana*; *e*, the same of *S. trivittata*; *f*, the same of *S. knabi*

ther specialization of this type, the air tube having become elongated, allowing the larva to sink lower in the water, while the peculiar rapacious antennæ are remarkably adapted.

*Corethra* shows a development in a different direction. The air tube is elongated, but apparently could not be adapted to the requirements of the larva, as it became necessary for it to sink deeper and deeper in the water, so it has begun to be disused. The horizontal position is still maintained by the formation of air bladders, one pair in the thorax, a second near the end of the abdomen. These are enlargements of the tracheal tubes and are joined by them to the air tube. It would seem that this fortunate arrangement supplied the larva with air-reservoirs, so that it is able to stay long below the surface and frequent the depths where it finds its subsistence.



*Sayomyia* has accomplished a still further specialization along these lines. It has dispensed with the air tube entirely and the trunks of the tracheal tubes as well, while it floats like a transparent ghost deep in the pool, carrying its four sacs of air which are now never connected with the air above. We suppose that the air in these sacs is replenished by diffusion through the body walls from the air dissolved in the water; but the character appears to us as a very remarkable one which would not have been antecedently thought possible.

The Corethridæ, as here limited, include 23 species described from North America. Of these we know the larvæ of 15 more or less completely. There are no unknown genera, and it is probable that the unknown species of *Dixa* and *Sayomyia* are similar to the known ones. Indeed some of the species of *Dixa* may be synonymous; but on the other hand, there are probably a number of forms to be discovered. The subject has been very little worked.

The following synoptic table will separate the known larvæ:

1. Air tube present.....	2
Air tube absent, larvæ aquatic.....	7
2. Air tube sessile, larvæ at surface of water.....	3
Air tube elongate, larvæ below surface of water.....	6
3. Abdomen with false feet; antennæ not longer than other mouth parts	4
Abdomen without false feet; antennæ long and directed forward	
	<i>Eucorethra underwoodi</i>
4. Ciliated plates of the air tube without a projecting triangular hairless apex.....	<i>Dixa clavula</i> <sup>1</sup>
These plates with such an apex (fig. 2, a).....	5
5. Anal segment finely haired, the hairs shorter than the stout terminal cone (fig. 2, b).....	<i>Dixa recens</i>
Anal segment coarsely haired, the hairs longer than the small terminal cone (fig. 2, c).....	<i>Dixa centralis</i>
6. Antennæ moving in a horizontal plane; larvæ flattened dorso-ventrally.....	<i>Corethrella brakeleyi</i>
Antennæ moving in a vertical plane; larvæ subcylindrical,	
	{ <i>Corethra cinctipes</i> <sup>2</sup>
	{ <i>Corethra lintneri</i>
	{ <i>Corethra velutina</i>
	{ <i>Corethra karnerensis</i>

<sup>1</sup> = *modesta* Joh. According to Mr. Johannsen's figure (Bull. 68, N. Y. State Mus., pl. 48, figs. 5 and 7, 1903). I have not myself seen the larva. The projecting apex belongs to the outer sheath of the plate and it may not be shown in Johannsen's figure.

<sup>2</sup> I am unable to distinguish *Corethra cinctipes* Coq. and *C. velutina* Ruthe. The latter may not be the European form, but *C. karnerensis* Felt or *C. lintneri* Felt, which I am likewise unable to distinguish.







comprises 132 specimens, representing 16 species. In addition there are five specimens from Vancouver Island collected by Dr. Dyar, representing four species not included in those from the Kootenay country, namely, *Lestes congener*, *Æschna constricta*, *Sympetrum costiferum* and *S. vicinum*.

While at Banff, Alberta, the writer took an undetermined ♀ of *Æschna*; and Mr. N. B. Sanson, Curator of the Park Museum at Banff, subsequently sent him for determination three specimens of *Sympetrum scoticum*, a species which in all probability occurs in portions of British Columbia.

The most abundant species in the Kootenay District appear to be *Lestes forcipatus*, *Enallagma cyathigerum*, *Cordulia shurtleffi*, *Leucorhinia proxima*, *Sympetrum corruptum* and *Libellula quadrimaculata*.

The writer is indebted to Dr. Philip P. Calvert for kind assistance in naming some of the species of *Sympetrum* and for verifying the determinations of *Leucorhinia*.

[**Lestes congener** Hagen.

We did not find this species in the Kootenay District, but Dr. Dyar collected a single ♂ at Wellington, on Vancouver Island, September 2.]

**Lestes uncatus** Kirby.

Kaslo, August 5 (1 ♂, 1 ♀), August 7 (1 ♀).

**Lestes forcipatus** Rambur.

Kaslo, July 9 (3 ♂♂, 6 ♀♀)—all somewhat teneral; Mirror Lake, Kaslo, August 6 (1 ♀).

One of the ♂♂ is remarkable for its extremely short abdomen—measuring only 20.5 mm., the same length as the hind wing.

**Enallagma yathigerum** Charpentier.

“Lilypad Lake,” Kaslo, June 7 (Dyar: 2 ♂♂, teneral); June 10 (5 ♂♂, 2 of them teneral), June 26 (2 ♂♂), July 2 (3 ♂♂, 2 of them teneral), July 9 (5 ♂♂); Mirror Lake, Kaslo, August 6 (3 ♂♂, 1 pair *in coitu*); Loon Lake, Ainsworth, July 11 (1 ♂); Bear Lake, July 20 (5 ♂♂).

**Enallagma** sp.

“Lilypad Lake,” Kaslo, May 29 (Dyar: 1 ♀); Mirror Lake, Kaslo, July 7 (1 ♀), August 6 (2 ♀♀); Loon Lake, Ainsworth, July 11 (1 ♀).

These specimens belong either to *cyathigerum* or *calverti*, but as no character for separating the ♀♀ of these two species has yet been discovered they cannot now be determined specifically.



**Enallagma calverti** Morse.

Mirror Lake, Kaslo, August 6 (3 ♂♂); Loon Lake, Ainsworth, July 11 (1 ♂, 1 pair *in coitu*).

**Enallagma carunculatum** Morse.

Mirror Lake, Kaslo, July 17 (1 ♀), August 6 (6 ♂♂, 1 pair *in coitu*, 1 ♀).

**Ischnura cervula** Selys.

Mirror Lake, Kaslo, July 17 (1 ♂), August 6 (1 ♂).

**Æschna juncea** (Linnæus).

Kaslo, August 7 (1 ♂).

**Æschna multicolor** Hagen.

Loon Lake, Ainsworth, July 11 (2 ♂♂).

[**Æschna constricta** Say.

Not taken in the Kootenay District, but Dr. Dyar collected two ♂ specimens on Vancouver Island—one at Shawnigan Lake, August 31, and the other at Wellington, September 2.]

**Æschna** spp.

"Lilypad Lake," Kaslo, July 8 (1 ♀); Bear Lake, July 21 (1 ♀); South Fork Creek, August 11 (1 ♀).

Also a ♀ from Banff, Alberta, collected on August 16.

**Somatochlora semicircularis** (Selys).

Loon Lake, Ainsworth, July 11 (1 ♂); Bear Lake, July 20 (1 ♀).

The triangle is crossed in the left hind wing of the ♂ and in both hind wings of the ♀. The triangles are crossed in the fore wings of both specimens, but there is in the U. S. National Museum a specimen collected by the writer on the Snake River, Yellowstone National Park, August 14, 1896, in which the triangles of both fore wings are free, although the cross-vein is indicated at either end in the right wing.

**Cordulia shurtleffi** Scudder.

"Lilypad Lake," Kaslo, May 29 (Dyar: 1 ♂), June 7 (Dyar: 1 ♀), June 10 (3 ♂♂); Loon Lake, Ainsworth, July 11 (17 ♂♂).

Five of these specimens show irregularities in venation, as follows: The single ♀ has a *second* cubito-anal cross-vein in the right hind wing; while of the other specimens—♂♂, all from Loon Lake—one has a second cubito-anal cross-vein in the *right* hind wing; one has this vein, interrupted in the middle, in the *left* hind wing; one has this vein in *both* hind wings; while the fourth specimen has *no* cubito-anal cross-vein in *either* hind





1905. "Dragonflies from the Kootenay district of British Columbia."  
*Proceedings of the Entomological Society of Washington* 7, 16–20.

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