A Preliminary Survey of the Megaloptera of Oklahoma

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A preliminary survey of the Megaloptera of Oklahoma showed the presence of the species each of Sialidae (alderflies) and Corydalidae (dobsonflies and fishflies). One other sialid and three other corydalids may be present but have not as yet been collected. Keys, brief descriptions, and distribution are presented.

The Megaloptera is a small group of medium to large species of insects (10-75 mm in length). The larvae are predaceous and aquatic while the adults, eggs, and pupas are terrestrial. Both Sialidae and Corydalidae are found over the eastern one-half of Oklahoma with a few records of corydalids extending into western Oklahoma.

Despite being interesting, rather widely distributed, and at times, locally abundant, the Megaloptera, as a group, have not been well collected in Oklahoma. The K.C. Emerson Entomological Museum at Oklahoma State University has specimens of only six of the ten species that might be expected to occur in Oklahoma.

Keys for identification of various stages of these groups are found in a variety of publications. Those presented here were adapted from the following references: family separation (1); sialid adults (2); sialid eggs (3); corydalid adults (1,4,5); corydalid larvae (1,4); and corydalid eggs (6).

We are presenting this preliminary compilation of data in an attempt to further the collection and study of this interesting group of insects in Oklahoma. Readers are encouraged to furnish additional data and we will be glad to identify any specimens from the state or examine any collections available.

KEY TO THE FAMILIES

1. Adults……..2
   Other stages…….3
2. Ocelli absent; tarsal segment IV dilated; length 10-15 mm ……...….Sialidae
   Ocelli present; tarsal segment IV cylindrical; length over 25 mm……....Corydalidae
3. Egg masses…….…….4
   Other stages…….5
4. Eggs in masses about 15 mm in diameter; egg-burster (remaining on the hatched egg shell) V-shaped and sharply toothed……..Sialidae
   Eggs in masses 20+ mm in diameter; egg-burster elongate, apically rounded, or ridgelike and toothed……..Corydalidae
5. Larvae…….6
   Pupae……..7
6. With 7 pairs of segmented lateral filaments on the abdomen and a single long caudal filament……Sialidae
   With 8 pairs of nonsegmented lateral filaments on the abdomen; apex of abdomen with 2 anal prolegs, each bearing a pair of claws…….Corydalidae
7. Length 10-12 mm……...Sialidae
   Length 30 mm or more…….Corydalidae

Sialidae

This family is monotypic; *Sialis*, with 23 species in North America. Sialidae have previously been studied by Ross (2), Townsend (7), Flit (8), and Canterbury and Neff (3). Only three species have been found in Oklahoma, but a fourth should occur here (2).

The adults of our species are very similar in appearance and identification is based mostly on the external genitalia. Figures of the genitalia are presented by Ross (2); however, the figures of *S. velata* and *S. infumata* are listed incorrectly. Figures 29, 35, and 54 are *S. velata*, Figures 30, 36, and 60 are *S. infumata*. Adults are black or dark

*Journal Article 5009, Agric. Exp. Sta. Okla. State Univ. Projects S-914 and S-1460.
Proc. Okla. Acad. Sci. 67:23-26 (1987)

brown in color and range 10-15 mm in length. They are active during the warm midday hours but are short-lived and seldom found far from water.

The eggs are laid in masses of 200-900 on objects overhanging the water, most commonly on the leaves or branches of trees. They can be identified by features of the micropylar process, size and color.

Larvae are found in rivers, streams, lakes, and ponds. They burrow in the substrate and feed nonselectively on small animals found there. Larvae are not yet specifically identifiable. Pupation occurs in shoreline soil or litter. The life cycle is one or two years.

Sialids are more widely distributed in Oklahoma than the following records would seem to indicate. We have unidentifiable females or larvae from Cherokee, Mayes, and McCurtain Counties.

KEY TO THE SPECIES

1. Adults……1
   Eggs……8
2. Apex of abdomen with broad, rounded ovipositor (females)……6
   Apex of abdomen without ovipositor but with a more or less complicated assemblage of parts (males)……..3
3. Terminal plate produced at apex into a pair of long arms……...*S. mohri*
   Terminal plate with an apical incision or a pair of short, blunt horns……4
4. Apex of lateral plates produced into large knobs……*S. infumata*
   Apex of lateral plates not knoblike……..5
5. Basal lobes of genital hooks small,slender; in lateral view, terminal plate as long as genital hooks are high……..
   ……..*S. velata*
   Basal lobes of genital hooks larger, robust; in lateral view,terminal plate shorter than genital hooks are high……
   ……...*S. itasca*
6. Ninth sternite large, triangular, and distinctly sclerotized……*S. mohri*
   Ninth sternite membranous and difficult to distinguish……7
7. Eighth sternite rectangular and with the distal portions set out as distinct swellings……...*S. infumata*
   Eighth sternite narrow and with a distinct pit partially separating the sternite on the midline...*S. velata* and *S. itasca*
8. Egg masses usually occurring on the underside of leaves; micropylar projection conical, tapering apically,……
   surface with numerous coarse, blunt projections; egg tan to light brown……..*S. itasca*
   Egg masses usually occurring on twigs and other vertical plant parts; micropylar projection without coarse, blunt
   projections except near apex; egg grayish brown or dark brown……..….9
9. Micropylar projection less than 0.15 mm in length……..…..*S. infumata*
   Micropylar projection greater than 0.15 mm in length……10
10. Micropylar projection cylindrical, bearing rough, spinous apical third; egg dark brown……*S. velata*
    Micropylar projection lacking spinous apex, only slightly roughened; egg grayish brown……..*S. mohri*

Sialis mohri Ross

Adult: Color dark brown to black with the exception of several orange bars and spots on the head; as usual in *Sialis*, the females are slightly larger than the males; length 11-13 mm; collection dates from 12-26 April.

Eggs: Average 700 +/mass (range 500-900); eggs 0.58 mm long, 0.17 mm wide; color grayish brown except the micropylar projection, which is white.

Distribution: Pawnee, Payne, Pittsburg, and Tulsa Counties.

Sialis infumata Newman

Adult: Very similar to *S. mohri* except for differences in the genitalia; collected on 28 March.

Eggs: Range 440-450/mass; eggs 0.58 mm long, 0.15 mm wide; color dark brown except the micropylar projection, which is light brown.

Distribution: Payne County.

Sialis itasca Ross

Adult: Very similar to *S. mohri* except for differences in the genitalia; collection dates from 9 April to 30 May.

Eggs: Average 560/mass (range 330-580); eggs 0.57 mm long, 0.19 mm wide; color tan to light brown except micropylar

projection, which is white.

Distribution: Murray, Noble, Pawnee, and Payne Counties.

Sialis velata Ross

Adult: Very similar to *S. mohri*; females are not separable from *S. itasca* even on genital characters.

Eggs: Average 680/mass (range 575-780); eggs 0.58 mm long, 0.18 mm wide; color dark brown except micropylar projection, which is off-white.

Distribution: Not collected in Oklahoma, but recorded from Kansas and Texas by Ross (2).

Corydalidae

The largest and most common member of this family in Oklahoma is the dobsonfly, *Corydalus cornutus* (L.). We also have records of two other species and it seems likely that three others may be found here. Corydalids have been studied by Flint (5), Baker and Neunzig (6), Tarter et al. (9), Tarter et al. (10), and Stark and Lago (4).

Adults of most species are active during the evening hours and some are attracted to lights. The eggs are laid in masses, mostly on objects overhanging the water. Some species cover the egg mass with a soft white or light brown material. Eggs range from 75-1000+/mass.

The larvae are found in a wide variety of aquatic habitats. They feed on a wide variety of small aquatic invertebrates. Pupation occurs in the soil or in rotten logs or stumps near the larval habitat. The life cycle can range from two to five years.

KEY TO THE GENERA

1. Adults……2
   Other stages……..5
2. Forewings with small white spots in many cells; mandibles large, not concealed by the labrum……*Corydalus*
   Forewings lacking white spots; mandibles smaller, when closed mostly concealed by the labrum…….3
3. Wings black with irregular white patches……*Nigronia*
   Wings mottled gray-brown……..4
4. Antennae moniliform……*Neohermes*
   Antennae pectinate or serrate……*Chauliodes*
5. Larvae……6
   Egg masse……..9
6. Abdominal segments I-VII with ventral gill tufts at base of lateral filaments……...*Corydalus*
   Abdominal ventral gill tufts absent……7
7. Abdominal segment VIII with spiracles at the ends of two long respiratory tubes which extend past the……...
   terminal claws……..*Chauliodes*
   Spiracles of abdominal segment VIII not on tubes or on very short tubes……...8
8. Abdominal segment VIII with spiracles at the ends of short, tapered respiratory tubes, about 1.5 times as long ……...
   as wide……*Nigronia*
   Abdominal segment VIII with spiracles on posterior edge of segment, without respiratory tubes…….*Neohermes*
9. Eggs covered……10
   Eggs exposed……11
10. Eggs in three layers; with a tough, white covering……..*Corydalus*
    Eggs in a single layer; with a soft, light brown covering……..*Neohemes*
11. Eggs in a single layer; egg chorion with many small peltate processes…….*Chauliodes*
    Egg mass with a few eggs in a second layer; egg chorion smooth……*Nigronia*

Corydalus cornutus (L.)

Adult: Dobsonfly; large, mottled, brownish; often reaching 75 mm long; male mandibles elongated; collection dates from 6 June to 20 July.

Larva: Hellgrammite; large, reaching 65 mm long; the ventral gill tufts are the chief distinguishing characteristic; most commonly found under rocks in clear, flowing streams.

Egg mass: Composed of three layers of eggs with a tough, white covering over the mass; average 1000+ eggs/mass; eggs 1.3-1.4 mm long, 0.4-0.6 mm wide, with a smooth chorion.

Distribution: Adair, Bryan, Carter, Cherokee, Choctaw, Delaware, Johnston, Kay, LeFlore, Mayes, McClain, McCurtain, Murray, Nowata, Ottawa, Payne, Pontotoc, Pushmataha, and Washita Counties.

Chauliodes rastricornis Rambur

Adult: Medium sized, 25-40 mm long; mottled gray-brown in color; male antennae

pectinate, female antennae serrate; vertex of head with two large, rectangular, dark brown spots posterior to ocelli; male anal plate triangular in lateral aspect; collection dates from 10 April to 10 September.

Larva: Similar to *Corydalus* but smaller, up to 50 mm long, and lacking ventral gill tufts on the abdomen; distinguished by the long respiratory tubes on the last abdominal segment; middorsal abdominal line black.

Egg mass: Composed of one layer of eggs without a covering; average 500+ eggs/mass; eggs about 1 mm long and 0.5 mm wide, with many small, peltate processes on the chorion.

Distribution: Alfalfa, Carter, Cherokee, Jackson, Ottawa, Payne, Rogers, and Tulsa Counties.

A second species, *C. pectinicornis* (L.), is recorded from Missouri, Arkansas, and Louisiana and there are recent single records from NE Kansas and SE Texas (10). It should be found in eastern Oklahoma. The adults have large, yellow, rectangular spots on the vertex and the male anal plates are cylindrical in lateral aspect. The mid-dorsal abdominal line of the larvae is yellowish.

Neohermes concolor (Davis)

Adult: Medium sized, 25-40 mm long; mottled gray-brown in color; antennae moniliform, each segment of the male antenna with a ring of erect hairs; collection dates from 11 June to 2 August.

Larva: Similar to *Corydalus* but smaller and lacking ventral gill tufts on the abdomen; the spiracles of the eighth abdominal segment are on the posterior edge of the segment, not on respiratory tubes.

Egg mass: Composed on one layer of eggs with a soft, light brown covering; average about 75 eggs/mass; eggs 0.85 mm long, 0.40 mm wide, with a smooth chorion.

Distribution: Choctaw, Johnston, LeFlore, McCurtain, Osage, and Payne Counties.

Nigronia spp.

There are two species of *Nigronia* which might occur in eastern Oklahoma, but neither has been taken here. Both have black wings with white markings. The larvae have short respiratory tubes on the eighth abdominal segment. Larvae are usually found in quiet or stagnant water as opposed to most of our other species, which are found mostly in flowing streams. The egg masses are composed of one complete layer of eggs and a partial second layer and do not have a cover.

N. fasciatus (Walker) is recorded from Missouri, Arkansas, and Louisiana (10). In the adults the anal area of the hindwing is white. In the larvae the respiratory tubes of abdominal segment VIII are longer than the segment and nearly contiguous at the base.

N. serricornis (Say) is recorded from Missouri, Arkansas, Louisiana, and south-central Kansas (10). In the adults the anal area of the hindwing is black. In the larvae the respiratory tubes of abdominal segment VIII are shorter than the segment and widely separated.

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