

THE DAMSELFLIES OF OKLAHOMA
(ZYGOPTERA: ODONATA)

By

DONALD RAY MOLNAR

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West Texas State University

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Thesis Approved:

William A. Drew
Thesis Adviser

Jerry H. Young
Richard Berberet

W. D. Durham
Dean of the Graduate College

867538

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CHAPTER I

INTRODUCTION

Damselflies make up one suborder, Zygoptera, of the order Odonata or dragonflies. They are slender insects of delicate appearance and relatively feeble flight (Walker, 1953). The wings are similar and held together above the body or tilted upward when at rest. The head is wider than long, with large round eyes that are separated by more than the width of one eye. The prothorax is small, collar-like and more or less deeply divided by transverse furrows on the dorsal side into a succession of lobes, the hindmost of which is often hair-fringed or sculptured (Needham and Heywood, 1929).

The prothorax is much smaller than the mesothorax and the metathorax, which are greatly enlarged and fused to form a pterothorax (Smith and Pritchard, 1956). The backward slant of the pterothorax is one of the striking peculiarities of the structure of Odonata (Needham and Heywood, 1929). Throughout this paper the pterothorax will be referred to as simply the thorax. The legs are crowded forward and adapted for perching (Walker, 1953) and for catching and handling prey (Smith and Pritchard, 1956).

The abdomen is 10 segmented, much longer than the rest of the body and has the genital appendages at the distal end. A remarkable difference in this group of insects as well as all Odonata from other insects is the penis of the males occurring on the second abdominal segment

(Comstock, 1920). The males also have a pair of moveable unsegmented dorsolateral anal appendages and a pair of ventrolateral anal appendages behind the 10 segment, which are used to grasp the head or thorax of the female during copulation (Smith and Pritchard, 1956). The anal appendages in the female are usually simple and reduced or vestigial (Smith and Pritchard, 1956). Walker (1953) states that the anal appendages present excellent specific characters for some genera because they are adapted to engage parts of the female so accurately, that attempts to mate between different species is generally unsuccessful.

Of the 19 genera and 115 species of Zygoptera that occur in the United States (Needham and Heywood, 1929), Bick and Bick (1957) list 13 genera and 48 species as occurring in Oklahoma. Four species not listed by Bick and Bick (1957) have been included because of their occurrence in neighboring states.

This work was undertaken to simplify the identification process for many biologists working in the area of impact studies as well as combining the scattered information on Zygoptera that occur in the state by the preparation of dichotomous keys to the species of adult Zygoptera with accompanied species descriptions, county records and photographs of important taxonomic characters.

CHAPTER II

LITERATURE REVIEW

Damselflies are usually a conspicuous group of insects around streams, ponds and lakes. They are relatively large, attractive and are important predators as adults and larvae (Comstock, 1920). Little work on Oklahoma damselflies has been done. Bick and Bick (1957) state that the earliest Oklahoma records of damselflies were by Williamson (1912a, 1912b) from LeFlore and Okmulgee counties. In 1914 Williamson listed 17 species of damselflies that were collected in southeastern Oklahoma. Ortenburger (1926) listed 6 species that were collected in southeastern Oklahoma. Other works on damselflies of Oklahoma include that of Bird (1932) who gave county records for numerous species of Odonata including damselflies; Bick (1951) who listed several species from Muskogee County and Bick and Bick (1957) who listed 48 species along with county records.

The large diversity of eastern, western and southern species of damselflies (Bick and Bick, 1957) and the lack of accurate information as to the range of some species in existing works and the lack of a composite paper with keys, species descriptions and county records along with reasons given in the introduction was why this study was undertaken.

Keys were made by comparing identified specimens and literature. Works that were most useful in developing the keys and species descrip-

tions were those of Needham and Heywood (1929), Walker (1952, 1953), Garman (1917, 1927), Byers (1927), Pritchard and Smith (1956) and Fraser (1956).

CHAPTER III

KEYS TO THE FAMILIES, GENERA AND SPECIES OF ZYGOPTERA OF OKLAHOMA

Key to the Families of Zygoptera

1. Wings with distinctly more than eight antenodal crossveins,
quadrangle with several crossveins. Larger forms with the wings
partly or entirely darkened or colored
. Calopterygidae (=Agrionidae, Agriidae)

Wings with two to four antenodal crossveins, quadrangle free of
crossveins, mostly smaller forms with the wings hyaline or at most
slightly yellow 2
2. Wings with vein M_3 arising nearer the arculus than the nodus; short
intercalary veins present between M_3 and principal adjacent veins
and running to wing margin, stigma more than twice as long as
wide. Lestidae

Wings with M_3 arising nearer the nodus than to the arculus, base
of R_s arising nearer the nodus than the arculus; no intercalary
veins present; stigma not more, generally less than twice as long
as wide Coenagrionidae (=Coenagriidae)

Key to the Genera of Calopterygidae

1. Wings without red basal spot; thorax entirely dark metallic green to blue; wings without crossveins before the arculus. Calopteryx maculata
- Wings with red or brown basal spot; thorax metallic red and black or green and black with light areas; crossveins present before arculus Hetaerina

Key to the Species of Hetaerina

Males

1. Base of hind wings tinged with carmine similar to that of the front wing; legs striped, buff and black or dark brown. americana
- Base of hind wings tinted with brown; legs entirely dark, not striped titia

Females

1. Legs striped, buff and black or dark brown. americana
- Legs entirely black, face black titia

Key to the Genera of Lestidae

(after Needham and Heywood, 1929)

1. Vein M_2 originating about one cell beyond nodus. Archilestes grandis

Vein M_2 originating several cells beyond the nodus. Lestes

Key to the Species of Lestes

(after Walker, 1953 and Needham and Heywood, 1929)

1. Inferior anal appendages longer than superior anal appendages;
their apices incurved; total length 50 mm inaequalis

Inferior anal appendages shorter than superior anal appendages. . 2
2. Inferior appendages, roughly S-shaped, stout, their apices
divergent; dorsum of thorax dark. unguiculatus

Inferior appendages not S-shaped, apices not divergent. 3
3. Superior appendages with one distinct basal tooth on mesal margin .
. 4

Superior appendages with a distinct basal and apical tooth on mesal
margin 5
4. Dorsum of thorax and abdomen metallic green; inferior appendages
straight and linear; mesal border of superior appendages undulating
but not serrated. vigilax

Dorsum of thorax black with metallic green spots or stripes on
either side, mesal border of superior appendages deeply serrated. .
. alacer

5. Abdomen very long and slender; the hind wings less than two-thirds of its length, including appendages; inferior appendages sharply decurved. rectangularis

Abdomen of moderate length, stouter; hind wings about two-thirds of its length, including appendages; inferior appendages not decurved 6

6. Thorax metallic green, pale humeral stripe extremely narrow or in fully mature individuals absent; inferior appendages expanded distally. dryas

Thorax dull bronze to brownish or blackish; inferior appendages slender and straight, scarcely expanded distally. 7

7. Abdominal segment two three-fifths as long as segment three; anterior lamina more than two and one-half mm long, about two and a half times as long as abdominal sternum one; white shield shape cavity on vesicle of penis widest at front margin; medium V shaped incision on segment ten more than one-third the width of the segment at hind margin; distal tooth of superior appendages much smaller than proximal tooth, nearly always blunt. . forcipatus

Abdominal segment two half as long as segment three; anterior lamina less than 1.5 mm long, about twice as long as abdominal sternum one; white shield-shaped cavity on vesicle of penis widest behind or at middle; median V shaped incision of segment ten one-third or less of the segment width; distal tooth of superior appendage variable disjunctus

Females

1. Dorsum of thorax metallic green 2
 Dorsum of thorax black or dark brown 4
2. Humeral stripe reddish brown, one-third to more than one-half as
 wide as the metallic area on each side of median carina . . vigilax
 Humeral stripe yellowish, less than one-fourth as wide as the
 metallic area on each side of median carina 3
3. Ovipositor shorter than abdominal segment seven, the valves usually
 not reaching as far back as the extreme end of the abdomen; hind
 wings 27 to 29 mm long. inequalis
 Ovipositor as long as abdominal segment seven, the valves usually
 reaching as far back as the extreme end of the abdomen; hind wings
 21 to 24 mm long. dryas
4. Rear of head yellow; abdomen with a greenish tint . . unguiculatus
 Rear of head black or dark brown; abdomen never with a greenish
 tint. 5
5. Tarsi more or less pale yellow above. rectangularis
 Tarsi black above 6

6. Abdomen mostly pale above; length 39 mm and expanse 42 mm. . alacer

Abdomen mostly dark above size variable 7

7. Ovipositor as long as abdominal segment seven, the valves reaching
as far back as the extreme end of abdomen forcipatus

Ovipositor shorter than abdominal segment seven, the valves not
reaching as far back as the extreme end of the abdomen. . disjunctus

Key to the Coenagrionidae of Oklahoma

(Agrionidae-auct)

(After Needham and Heywood, 1929; Walker, 1953;

and Pritchard and Smith, 1956)

1. Middle and hind tibia with all spines of the anterior row generally
twice as long as the intervals between them 2

Middle and hind tibia with some or all spines of the anterior row
generally less than twice as long as the intervals between them. .4

2. Wings with two distinct rows of cells behind Cu_2 . . Hyponeura lugens

Wings with one row of cells behind Cu_2 (sometimes a few scattered
double cells present); vein Cu_2 ten or more cells long. 3

3. Postnodal crossveins of the front wing 12 or more in number; M_2
arising between crossveins five and nine on front wing. . . . Argia

Postnodal crossveins of the front wings usually less than 12 in number; M_2 arising between third and fourth crossvein of front wing. Nehalennia intergricollis

4. Postocular spots present; mesopleural suture usually with a distinct black stripe. 7

Postocular spot absent; mesopleural suture without a distinct black stripe. 5

5. Body black or tan and red 6

Dorsum of thorax metallic green or bronze
 Nehalennia intergricollis

6. Male with superior anal appendage bifid; female with ventral spine on abdominal segment eight; body short and thick set. . Amphiagrion

Male with superior anal appendage not bifid; female without ventral spine on segment eight; body slender. Telebasis salva

7. M_2 separating from M_{1-2} near the fourth postnodal crossvein on the fore wing, nearest the third (or second) on the hind wing; (except Enallagma basiden, which can be distinguished by having the humeral black stripe divided by or surrounding a thin blue stripe in the male, the stripe is yellow in the female); stigma in front and hind wing of male usually different in color or size or both 8

M_2 separating from M_{1-2} near the fifth postnodal crossvein on the

front wing, fourth on the hind wing or beyond; (except Enallagma antennatum which has the separation near the fourth on front and fourth on hind wings); stigma in front wing and hind wing of male similar 9

8. Dorsum of abdominal segment four black; except a narrow pale basal ring; stigma of front wing of male not remote from the margin Ischnura

Dorsum of abdominal segment four yellow with the exception of a basal and apical spot in the male and a small apical spot in the female; stigma of the front wing of the male remote from the margin. Anomalagrion hastatum

9. Wings stalked to anal crossing; abdomen very long Teleallagma daeckii

Wings not stalked to anal crossing; stigma with margin not shorter than radial margin; male without a bifurcate process on abdominal segment eight; female with a vulvar spine on sternum of abdominal segment eight Enallagma

Key to Oklahoma Species of Amphiagrion

(After Walker, 1953)

1. Smaller and less robust eastern species; length of thorax about one-fifth that of abdomen; ventral thoracic tubercles relatively low saucium

Larger more robust western species; length of thorax one-fourth or more than that of the abdomen; ventral thoracic tubercles prominent abbreviatum

Key to Oklahoma Species of Argia

Males

1. The total area of dark color on abdominal segments three-six, or the thoracic dorsum, or both, less than the pale area of the same parts 3

The total area of dark color on abdominal segments three-six and the thoracic dorsum, greater than the pale area of the same parts, wings clear or with tips smoky. 7

2. Black middorsal thoracic stripe a mere hairline. Antehumeral pale stripe very broad, four - six times as wide as the middorsal dark stripe; humeral black stripes not of uniform thickness throughout, the ends being greatly thickened, while the median third or more is reduced to a hairline or is absent; abdominal terga three to five almost entirely black. Posterior lobe of the prothorax black. A black spot on the dorsum of abdominal segment one. . . . apicalis

Black middorsal thoracic stripe wide. Antehumeral pale stripe narrow one-half to one and one-half as wide as the middorsal dark stripe. 3

3. Humeral stripe forked 4

- Humeral stripe not forked 6
4. Superior appendage bilobed or trilobed at apex, inner margin rounded and convex before the tip; inferior appendage not bifid agrioides
- Superior appendage almost entire at the tip, the inner margins with an anteapical projection. 5
5. Pale color on thorax and abdominal segment three-six blue; antenodals of the fore wing three immunda
- Pale color of the thorax and abdominal segments three-six violet, antenodals of the front wing four violacea
6. Dark humeral stripe wider than the pale antehumeral, straight and of equal width throughout bipunctulata
- Dark humeral stripe narrower than the pale antehumeral, at least in the middle third of its length, dark humeral stripe not of uniform thickness throughout, the ends being greatly thickened, while the median third or more is reduced or wanting. vivida
7. Stigma surmounting more than one cell in both wings, superior appendages not bifid; abdomen 35 to 37 mm long. Pale antehumeral stripe half as wide as the dark middorsal stripe, tergum of abdominal segment eight usually entirely black or pale olive with a longitudinal black stripe on either side in young specimens; metepimeron pale or black. Abdomen with pale long dorsal line on

- segment three to seven; inferior anal appendage without tubercle .
 moesta
- Stigma surmounting one cell or less in both wings 8
8. Tergum of abdominal segment eight black 9
- Tergum of abdominal segment eight to ten blue 10
9. Superior anal appendage bifid at the tip; segment nine mostly blue
 on dorsum tibialis
- Superior anal appendage not bifid at tip; segment nine mostly
 black on dorsum translata
10. Pale antehumeral stripe narrow, one-third to one-half as wide as
 the black middorsal stripe. Humeral stripe wider than antehumeral
 pale stripe and not split sedula
- Pale antehumeral stripe as wide as or wider than the dark
 middorsal stripe. Humeral stripe not as wide as the antehumeral
 stripe and split in its upper third alberta

Females

1. Dorsum of abdominal segments three to six mostly pale 2
- Dorsum of abdominal segments three to six mostly black (four to
 six in bipunctulata) 11

2. Postbasal stripe present on abdominal segments three-six and confluent with the apical black. 3
 Postbasal stripes present on abdominal segment three or four-six, but not usually confluent with the apical black 6
3. Dark humeral stripe forked; length of abdomen 20 mm . . . violacea
 Dark humeral stripe not forked; mesepisternal tubercles present 4
4. Dark middorsal and humeral stripes reduced to a thin line or absent. 5
 Dark middorsal and humeral stripes wide, nearly as wide as the pale antehumeral stripe vivida
5. Thorax usually with a black line on either side of the middorsal carina, which is also black intruda
 Thorax with only the middorsal carina black, no black lines on either side of it moesta
6. Segments eight to nine of abdomen without black on dorsum (except on 9 in some specimens of vivida) 7
 Segments eight to nine of abdomen pale, each with a long black stripe on each side of the dorsum, from base backward to a variable distance 9

7. Antenodal cells in front wing three immunda
- Antenodal cells in front wing four to five. 8
8. Black middorsal thoracic and humeral stripes reduced to a mere line
or absent, mesepisternal tubercles absent sedula
- Black middorsal thoracic and humeral stripes and mesepisternal
tubercles present; middorsal carina widening out into a broad
triangle in the mesostigmal plate vivida
9. Mesostigmal lamina prolonged at the mesal end into a slender
process 10
- Mesostigmal lamina rounded with no slender prolongation. agrioides
10. Length of abdomen 20 mm; mesostigmal lamina with a projection near
the dorsal carina violacea
- Length of abdomen 22 mm, mesostigmal lamina without a projection
near dorsal carina. alberta
11. Black middorsal thoracic stripe a mere hairline apicalis
- Black middorsal stripe at least one-third as wide as the pale
antehumeral stripe. 12
12. Abdominal segments two and three mostly pale. bipunctulata
- Abdominal segment two and three mostly dark 13

13. Mesepisternal tubercle well developed, dorsum of abdominal segments eight and nine with pale black markings translata
- Mesepisternal tubercle absent, dorsum of segments eight and nine black tibialis

Key to the Species of Enallagma

(Modified from Needham and Heywood, 1929)

Males

1. Superior anal appendages not bifid. 2
- Superior anal appendages bifid. 7
2. Superior anal appendages small, greatest length less than tenth segment. Dorsum of abdominal segment two blue with a black spot or spots of various size, but never reaching from the base to the apex of the segment (except divagans); color blue-black 3
- Superior anal appendage large, greatest length as long as or longer than tenth segment. Dorsum of abdominal segment two with black extending from the base to the apex; color orange-yellow and pale blue and black 5
3. Abdominal segments eight and nine marked with black . . . geminatum
- Abdominal segments eight and nine unmarked with black 4
4. Abdominal segment two with dorsum entirely black. divagans

Abdominal segment two blue with a black spot, superior anal
 appendage with tip recurved, humeral dark stripe broken and very
 narrow. clausum

5. Dorsum of abdominal segment nine pale blue or orange 6

Dorsum of abdominal segment nine black; pale postocular spots
 linear and not confluent with the pale color of the rear of the
 head. Pale antehumeral stripe narrower than the black humeral
 stripe; the two basal joints of the antennae black; no pale spots
 about the ocelli. dubium

6. Ninth abdominal segment yellow, except in teneral specimens . . .
 signatum

Ninth abdominal segment blue vesperum

7. The inferior arm of the superior anal appendage as long as or
 longer than the superior arm 8

The inferior arm of the superior anal appendage shorter than the
 superior arm and usually ventrally directed 11

8. Without a tubercle between the arms of the bifid superior anal
 appendages; dorsum of segment two entirely black. 9

With a tubercle between the arms of the superior anal appendages .
 10

9. Superior anal appendages with the arms approximate, the inferior arm longer than the superior arm. exsulans

Superior anal appendage with arms widely divergent, the inferior arm equal in length to the superior; segments eight and ten black on dorsum antennatum

10. Dorsum of segments four and five more than half black
 carunculatum

Dorsum of segments four and five less than half black; superior anal appendage with tubercles not projecting noticeably beyond the dorso-caudal angles when viewed from the side, arms longer and more divergent civile

11. With a tubercle between the arms, visible in a profile view, black markings on abdominal segment two not V-shaped; pale color on three blue. praevarum

Without a tubercle between the arms, or if one present not visible in profile view 12

12. Segment two with black on dorsum in isolated spots, streaks or bands; caudal half at least of seven pale, eight entirely pale. .
 aspersum

Segment two with black of the dorsum usually extending from base to apex 13

13. M_2 arising nearest fifth postnodal crossvein in the fore wing;
fourth in the hind wing; eight to ten postnodal crossveins
present; superior anal appendage with the inferior arm appearing
as a round basal projection traviatum
- M_2 arising nearest the fourth postnodal crossvein in the fore wing;
third in the hind wing; five and six postnodal crossveins present
. basiden

Females

1. Middle prothoracic lobe with a pair of dorsal pits; black color
of abdominal segment two extending from base to apex. 2
- Middle prothoracic lobe without a pair of dorsal pits 3
2. Black humeral stripe not touching the lower end of the mesostigmal
plate; antehumeral stripe wider than the black humeral stripe . .
. vesperum
- Black humeral stripe touching the lower end of the mesostigmal
plate; dorsum of segment ten pale signatum
3. Tenth abdominal terga usually without black markings 4
- Tenth abdominal terga with black markings 8
4. Dorsum of segment nine mostly black; two to three antenodal cells
. antennatum

- Dorsum of nine entirely blue or with black lines or spots . . . 5
5. Dorsum of nine entirely blue. traviatum
- Dorsum of nine with black lines or spots. 6
6. Dorsum of nine with a pair of black spots on the basal half . . 7
- Dorsum of nine without black spots, those being replaced by two dorsolateral lines either joined or separated at the meson; segment eight black with pale blue lateral spots. divagans
7. Postnodal crossveins ten to eleven. exsulans
- Postnodal crossveins five to six. basidens
8. Dorsum of segment eight black with a large spot on either side of the meson on the cephalic half 9
- Dorsum of segment eight not so marked 10
9. Segment seven black geminatum
- Segment seven blue, never with more than a fine line of black aspersum
10. Segment eight entirely blue, dorsum of two blue with a black spot. clausum
- Segment eight with some black 11

11. Dorsum of segment one with black reaching from base to apex . . .
 civile
- Dorsum of segment one with black not reaching the apex. . . . 12
12. Hind margin of prothorax convex throughout; mesostigmal plate with
 a diagonal ridge from the caudomesal to the cephalolateral angles;
 segment eight entirely blue or with a black band on dorsum
 narrower anteriorly than posteriorly, nine black on dorsum. . . .
 carunculatum
- Hind margin of the prothorax convex medially, slightly concave
 to truncate on either side. praevarum

Key to the Species of Ischnura

(After Needham and Heywood, 1929)

Males

1. Anterior surface of thorax solid black, no antehumeral stripe;
 inferior anal appendage bifid denticollis
- Anterior surface of thorax not solid black. 2
2. Antehumeral green stripe indicated by a pair of widely separated
 angular spots; bifid process on ten only about one-fourth as
 high as ten is wide, forked in less than apical half. . . . damula
- Antehumeral green stripe present (may be a superior spot on a
 smaller inferior spot, appearing as an exclamation mark). . . . 3

3. Abdominal segment nine entirely black on dorsum 4

Abdominal segment nine with blue on dorsum predominating. . . . 5

4. Abdominal segment eight blue; antehumeral stripe complete
 ramburii

Abdominal segment eight bronze-black; antehumeral stripe like an
 inverted exclamation mark posita

5. Abdominal segment nine usually entirely blue, except for apical
 teeth 6

Abdominal segment nine with lateral or broad transverse black
 stripes or spots; segment eight with black markings, process of
 inferior anal appendage not bifid verticalis

6. Abdominal segment ten with dorsal bifid process 7

Abdominal segment ten with a cylindrical entire process
 kellicotti

7. Abdominal segment eight entirely blue except for apical teeth;
 superior appendage decurved, one-half the length of ten, with an
 acute curved apical process; inferiors nearly as long as ten with
 an outer acute process. barberi

Abdominal segment eight usually with lateral black markings . . .
 demorsa

Females

1. Prothorax with no teeth or tooth-like process 2
 Prothorax with at least a tooth-like process on the hind lobe;
 middle prothoracic lobe with a small tooth on each side; dorsum
 of abdominal segment ten entirely black denticollis
2. Size large; length of abdomen over 21 mm. 3
 Size smaller; length of abdomen under 20 mm 5
3. Hind wing under 16 mm in length; segment nine black on dorsum . .
 ramburi
 Hind wing over 19 mm in length; spine absent on the apical margin
 of sternum of segment eight 4
4. M_2 arising nearest the fifth postnodal crossvein in the fore wing
 kelllicotti
 M_2 arising nearest the fifth postnodal crossvein in the fore
 wing barberi
5. Hind margin of prothorax convex throughout and with a small median
 notch demorsa
 Hind margin of prothorax high, sides straight and convergent,
 convex medially; no median notch. 6

6. Posterior ridge of mesostigmal laminae elevated along their entire length in the form of either flange-like expansions that conceal the apices or prominent lobes. Sternum of segment eight without apical spine; middle lobe of prothorax with a pair of nipple-like elevations. damula

Posterior ridge of mesostigmal laminae low along entire length; no flange-like elevations or prominent lobes. 7

7. Antehumeral stripe usually divided like an exclamation mark; posterior ridge of mesostigmal laminae very low; sternum of segment eight without posterior spine posita

Anterior stripe entire; posterior ridge of mesostigmal laminae elevated along their entire length; sternum of segment eight with a posterior spine verticalis

CHAPTER IV

DESCRIPTIONS TO THE FAMILIES, GENERA AND SPECIES OF ZYGOPTERA OF OKLAHOMA

Calopterygidae (=Agrionidae)

This family can be easily identified by the numerous, ten or more, antenodal crossveins. They are medium to large with green, red or blue metallic colored bodies and have dark wings, or red or brown basal spots on the wings. Two genera and three species have been recorded from Oklahoma. This family contains some of the most beautiful damselflies of our fauna.

Calopteryx (=Agrion) (Fabricius)

This genus contains one species that is easily distinguished by its metallic blue to green body, wholly or partly darkened wings and medium to large size.

Calopteryx maculatum (Beauvois) (Figs. 3D, 4A, 9A)

Body Length: 45 to 55 mm.

Wing Span: 55 to 65 mm.

Male: Head and dorsum of thorax metallic blue; thorax with humeral suture black, mesepimerion black on dorsal half and metallic

blue-green to green on ventral half; metepisternum and metepimerion metallic blue to green except along lateral suture. Wings with 25 to 30 antenodal crossveins, crossveins wanting before arculus, color is from smoky brown to dark brown. Abdomen metallic blue, blue-green or green on dorsal half; superior anal appendages longer than inferiors and curved medially, the outer surface with numerous small teeth and short hairs.

Female: Color and markings similar to male. Wings smoky brown with apical fourth darker with a white stigma of 7 to 9 cells. Abdomen entirely dark brown to black; ovipositor not reaching apex of abdomen.

County Records: Adair, Alfalfa, Caddo, Choctaw, Cleveland, Comanche, Delaware, Ellis, Harper, Kay, McCurtain, Marshall, Murray, Muskogee, Nowata, Oklahoma, Osage, Ottawa, Pawnee, Payne, Pittsburg, Pushmataha, Sequoyah, Washita, Woods, Woodward.

Hataerina Hagen

These are large colorful damselflies. The body is metallic red in males and metallic red to green in females. The wings of the male have the red basal area much brighter than in the females which is more brown than red. This genus has two species, americana Fabricius and titia Drury which can be separated by characters given in the key. H. americana occurs in most parts of the state while H. titia is restricted to the central and eastern parts.

Hetaerina americana (Fabricius)

(Figs. 3E, 4B-C, 9C)

Body Length: 45 to 50 mm.

Wing Span: 65 to 70 mm.

Male: Head dark brown to black with red areas, labrum yellowish. Dorsum of thorax metallic red with middorsal carina black, humeral suture yellow to cream color on the anterior three-fourths, the remainder black; mesepimerion metallic red with pale area on ventral margin near base of legs, metepisternum with a median black area bordered by pale stripe on ventral half; metepimerion mostly black with pale area along lateral suture. Legs dark on the lateral surface and pale medially, tibia with a row of spines becoming shorter toward the apex, their length from 2 to 4 times the distance between spines. Wings with basal third red to carmine in both pair. Abdomen dark brown with greenish tinge on dorsal surface; superior anal appendages about three times longer than the inferiors, the superiors also have a large anterior lobe, a smaller posterior lobe, the apices curved medially and 10 to 20 small teeth on the lateral margin.

Female: Head color and markings similar to male. Thorax greenish bronze to greenish-red with the same general markings as the male. Abdomen of same color as male; ovipositor not reaching the apex. Wings with basal third bronze in both pair.

County Records: Alfalfa, Beckham, Blaine, Caddo, Canadian, Cimarron, Choctaw, Cleveland, Comanche, Cotton, Custer, Ellis, Garvin, Grant, Kay, Harmon, Harper, Jackson, Johnston, LeFlore, McClain,

McCurtain, Marshall, Major, Murray, Pawnee, Payne, Roger Mills,
Sequoyah, Washita, Woods.

Hetaerina titia Drury (Fig. 4D)

Body Length: 48 to 52 mm.

Wing Span: 55 to 62 mm.

Male: Head, thorax and abdomen dark brown to black with lighter brown around base of legs and along sutures of thorax. Legs entirely dark. Wings smoky with rust color basal spots and darker area beyond stigma. Abdomen mostly black with a few pale markings. Superior anal appendages twice as long as the inferiors, with the apices contiguous and convergent, a subapical median shelf is present. Inferior anal appendages with apices pointed dorsally.

Characteristics of the female are from Needham and Heywood (1929)

Female: Color and markings similar to male but with the following differences: paler coloration, better development of stripings on sides of thorax, little development of ruby color on wing base and a shorter and stouter abdomen.

County Records: Alfalfa, Bryan, Grady, Johnston, LeFlore,
Muskogee, Osage, Pawnee.

Lestidae

The members of this family are medium to large and can be distinguished by having the M_3 vein arising nearer the arculus than the

nodus. This family contains two genera and nine species that occur in Oklahoma.

Archilestes Seyles

This genus contains only one species in Oklahoma, it is the largest damselfly to occur here. It can be identified by having the M_2 vein originating about one cell beyond the nodus, its large size, smoky wings with stigma surmounting several cells and dull metallic green dorsal and lateral yellow stripes of the thorax.

Archilestes grandis Rambur

(Figs. 3B, 7H, 9K)

Body Length: 55 to 60 mm.

Wing Span: 70 to 80 mm.

Male: Head dark brown with black markings; labrum light brown to gray with hairs; ventral surface of head light tan. Thorax with dorsum brown with granulated dark green antehumeral stripe; mesepimerion brown with dark green spot about half the antehumeral stripe; yellow lateral stripe present near the lateral suture. Wings with a yellow tinge, stigma same on both fore and hind wings. Abdomen more or less dark brown with the ninth and tenth segments light brown with a middorsal dark area on ten; superior anal appendage three to four times longer than the inferiors, superiors also with a tooth about one-fourth the distance from the base and with the apical third curved medially.

Female: Head, thorax and abdomen similar to the male. Ovipositor

reaching to apex of the abdomen, valvae serrated, stylets of uniform size throughout and about one mm in length.

County Records: Cimarron, Cleveland, Comanche, Custer, Ellis, Greer, Latimer, McClain, Marshall, Murray, Nowata, Pawnee, Payne, Potowatomie, Woods, Woodward.

Lestes Leach

The members of this genus can be identified by the M_2 vein arising several cells beyond the nodus, wings clear or hyaline with a large stigma and abdomen long and slender. This genus is represented in our fauna by eight species.

Lestes alacer Hagen (Fig. 71)

Body Length: 38 to 42 mm.

Wing Span: 45 to 50 mm.

Male: Labrum, anteclypeus and lower half of head light, remainder of head black. Prothorax light with dark median and lateral stripes. Thorax with thin pale carina, middorsal black stripe twice as wide as antehumeral brown stripe and not reaching anterior end of mesepimerion. Legs light with brown lateral stripe, tarsi entirely dark. Stigma almost two cells long. Abdominal segments one to six with dorsal dark stripe narrow on anterior three-fourths, segments seven and eight almost entirely black, segments nine and ten pale with middorsal black band. Superior anal appendage with subbasal median spine and apices converging; inferior anal appendages straight and three-fourths as long

as superiors.

Female: Head similar to male. Prothorax light with five dark spots. Thorax with middorsal dark stripe only; metepisternum yellowish. Abdomen similar to male except segments seven and eight with less black on dorsum. Ovipositor not reaching apex of abdomen; stylets divergin and less than one mm long.

County Records: Cleveland, Comanche, Cotton, Garvin, Grady, McClain, Oklahoma, Washita, Woods.

Lestes disjunctus Selys (Fig. 7J)

Body Length: 34 to 38 mm.

Wing Span: 48 to 52 mm.

Male: Labrum, anteclypeus and lower part of head pale green, remainder of head black. Prothorax black; thorax black except thin antehumeral stripe and lower parts of metepisternum and metepimerion which are pale; legs black with median stripe. Abdomen with segment one and two mostly black, segments three to six mostly pale with dorsal black stripe, remainder of abdomen mostly dark, dark area with a greenish sheen. Superior anal appendage with subbasal and subapical spines, apices convergent; inferior anal appendages three-fourths as long as superiors and with apical third concave.

Female: Coloration and markings similar to male except less dark color on dorsum of abdominal segments, the apical part of dorsal dark stripe wider than basal part. Ovipositor shorter than apex of abdomen with stylets divergent.

County Records: Caddo, Carter, Cleveland, Comanche, Hughes, McClain, McCurtain, Oklahoma, Washita, Woods.

Lestes dryas Kirby (Fig. 8A)

Body Length: 33 to 36 mm.

Wing Span: 40 to 44 mm.

Male: Lower part of head, labrum and mandibles, light green to yellow, clypeus dark with a metallic blue-green spot; remainder of head dark with metallic green areas. Thorax with dorsal half metallic green; metathoracic segment, except posterior fourth and sternites, yellow in color; parts of the metepimerion becoming dark with age. Abdominal segments one to seven metallic green on dorsal half, light on ventral half, segments eight to ten more dark with a small amount of purple on dorsal half. Superior anal appendages with two teeth on inner margin and are longer than the inferior anal appendages, the apical third of the superior anal appendages curved medially; the inferior anal appendages enlarged at apex and curved slightly inward; apex of abdomen with many hairs on dorsal surface.

Female: With same markings and color as male except a narrow humeral light band present. Ovipositor less than the length of abdominal segment seven and extending to the apex of abdomen; stylets relatively long, slender and not contiguous.

County Record: Walker (1953) recorded it from Oklahoma.

Lestes forcipatus Rambur (Fig. 8C)

Body Length: 38 to 42 mm.

Wing Span: 44 to 48 mm.

Male: Labrum, anteclypeus and lower part of head bluish to light brown, remainder of head black. Prothorax dark with lighter brown areas; thorax with thin light hairline carina, middorsal black stripe twice as wide as antehumeral pale stripe, dorsal half of mesepimerion dark, the remainder of thorax light except on mesinfraepisternum; legs light with dark lateral stripe on femur and anterior dark stripe on tibia; tarsi entirely dark. Abdominal segments with dorsal black stripe increasing in coverage toward apex; segments seven and eight almost entirely black, segment nine with ventral half light; superior anal appendages with only a subbasal mesal spine, subapical teeth may be present, apices convergent; inferior appendages concave on apical third and three-fourths as long as superiors.

Female: Color and markings similar to male; labrum and anteclypeus pale brown. Abdomen with less black on dorsum than male; ovipositor reaching to or beyond apex of abdomen, valvae serrated, stylets almost straight.

County Records: Questionable if it occurs in state. Bick and Bick (1957) identified specimens that Bird identified as L. forcipatus as L. disjunctus australis Walker.

Lestes inaequalis Walsh

Walker (1953) gives the following characteristics for this species:

Body Length: 45 to 50 mm.

Wing Span: 25 to 29 mm.

Male: Head and prothorax dark above with few markings, ventral regions mostly pale yellow, anteclypeus greenish, postclypeus black, rear of head yellowish brown. Thorax pale with orange-brown fine line on middorsal carina and humeral suture. Legs black with streaks of light yellow on femur, tibia with outer surface yellow, tarsi black. Abdominal segments black on dorsum with distinct basal pale ring, ventral half yellow. Superior anal appendages meeting in an arc, inner margin with a strong subbasal tooth followed by a spinose or serrated edge ending in a short blunt subapical tooth; outer margin with coarse spines on apical half. Inferior anal appendages slightly longer than superiors, stout at base and narrowing toward apex, the apices sharply hooked mesad so they meet or overlap.

Female: Coloration similar to male except the middorsal thoracic carina and humeral suture marked with very narrow yellow streaks. In tenerals there are broad median and humeral orange-brown stripes. Ovipositor reaching end of tenth sternum, but not to end of abdomen.

County Record: LeFlore, Pushmataha.

Lestes rectangularis Say (Figs. 8D-E, 9L)

Body Length: 40 to 45 mm.

Wing Span: 45 to 47 mm.

Male: Labrum light green, clypeus and rest of head black. Dorsal half of prothorax black, ventral half light; thorax black except for a light humeral stripe and middorsal carina, remainder of thorax light yellowish. Legs yellow with a brown stripe on outer surface of femur and front tibia only, spines black. Stigma of hind wing longer than front wing. Abdomen light brown with dorsal surface darker and with a greenish tinge; segments eight to ten darker than one to seven; superior anal appendage with a mesal shelf having a basal and a subapical tooth with several smaller teeth between, the apical fourth darker and curved inward. The inferior anal appendages shorter than the superiors, closer together and black on apical half.

Female: Markings and color the same as male except the abdomen is more green than on the male. Ovipositor less than half as long as segment seven and not extending beyond apex of abdomen; ventral margin of valves serrated, stylets slender, dark brown and curved medially.

County Records: Cleveland, Major, Pittsburg, Woods

Lestes unguiculatus Hagen (Fig. 8F)

Body Length: 34 to 37 mm.

Wing Span: 40 to 45 mm.

Male: Labrum light green, remainder of head, except mouth parts, black. Prothorax mostly black. Dorsum of thorax black except middorsal carina and humeral stripes which are yellowish; lower part of thorax yellowish except area around lateral suture and posterior margin of metepisternum. Abdomen dark with a greenish sheen on dorsum of

segments one to six, segments seven to ten lacking green color. Superior anal appendages about one and one-half times as long as inferior anal appendages, with one tooth present basally on inner surface and a row of small spines beyond; the outer margin with five to eight small teeth, the apical third turned medially and darker than basal two-thirds. Inferior anal appendages with base twice width of apex, converging beyond middle and divergent at apex which is covered with white hairs.

Female: Same as male except for the following: pronotum dark on dorsum and light on plural and ventral parts. Abdomen with all segments with a greenish sheen. Ovipositor with ventral half dark, basal half yellow and extends to the apex of abdomen, the ventral edge of valvae serrated, stylets less than length of segment ten and with their apices convergent.

County Records: Lincoln, McClain.

Lestes vigilax Hagen (Figs. 8G-H)

Body Length: 42 to 45 mm.

Wing Span: 48 to 52 mm.

Male: Head entirely black. Dorsal half of thorax greenish black with thin brown humeral stripe, remainder of thorax light to dark brown. Legs entirely dark. Stigma of wings almost three cells long. Abdomen long and slender with dorsal half greenish black on segments one to five, segments six to ten almost entirely black without green; superior anal appendages with a median subdorsal spine and an

undulating shelf, the inferior anal appendages long and slender, reaching four-fifths to the apex of the superiors.

Female: Labrum, lower part of anteclypeus and lower part of head pale green, remainder of head black. Thorax and abdomen similar in color and markings as in the male but with less green. Legs with dark lateral stripe on femur. Ovipositor not reaching apex of abdomen and valvae not serrated, may have small notches.

County Records: Pushmataha

Coenagrionidae

This is the largest family of damselflies to occur in Oklahoma, most are medium to small. They can be distinguished by the M_3 vein which originates closer to the nodus than to the arculus. This family is represented in our fauna by nine genera and 38 species.

Amphiagrion Selys

These are small damselflies with head and dorsum of thorax black, ventral part of thorax and abdomen reddish. They have short spines on anterior surface of middle and hind tibia. This genus contains two species recorded from the western half of Oklahoma.

Amphiagrion abbreviatum (Selys) (Figs. 4F-6)

Body Length: 22 to 24 mm.

Wing Span: 29 to 31 mm.

Male: Head and thorax mostly black, paler area on front of head and near ventral surface of thorax; labrum brown. Head and thorax covered with down-like hair. Antennal segments one and two equal length, three one and one-half times as long, and four as long as one - three combined. Legs with femur entirely dark, tibia brown with light stripe on mesal surface and with black spines, tarsi pale with black spines. Abdomen reddish-brown to red with small black spot on posterodorsal surface and becoming larger on segments seven - ten which are more black than red. Superior anal appendages about half the length of the inferiors with pale yellow mesal half and brown sclerotized outer part; inferior anal appendages shorter than tenth segment, pointed and tapering to a black dull tip which are curved medially.

Female: Similar to the male. Abdomen brownish-red, usually with a series of paired oblique posterodorsal spots on segments three to seven, with larger spots on segments eight and nine.

County Records: Cleveland, Comanche, Woodward.

Amphagrion saucium (Burmeister) (Fig. 4H)

Body Length: 24 to 26 mm.

Wing Span: 30 to 34 mm.

Male: Labrum, anteclypeus and lower parts of head red; postclypeus and remainder of head black. Prothorax and dorsum of thorax to anterior base of front wings black, remainder of thorax and all of abdominal segments one - six rust colored, segment seven rust color with black spot on subapical half, segments eight and nine rust color

with sides black from base to apex, ten rust color with lateral basal black spot and with a dorsal apical elevated notch. Wings with stigma longer than wide. Legs pale with black spines. Superior anal appendages not bifid and slanting ventrally, inferiors bowed with apices convergent.

Female: Markings and color similar to male. Ovipositor reaching apex of abdomen, abdominal segment eight with ventral apical spine.

County Records: Records show that A. E. Pritchard collected specimens in June, 1932 from Oklahoma county; August, 1932 from Alfalfa county; June, 1933 from Cimarron county; July, 1933 from Beaver and Texas counties and August, 1933 from Ellis county. No specimens remain to be examined. Kennedy (1917) calls this and A. abbreviatum as one species A. saucium with two varieties.

Anomalagrion Say

These are small black and yellow damselflies which have the dorsum of segment four yellow except a basal and apical dark spot in male and a small apical spot in female. M_2 separates from M_{1-2} near the fourth postnodal crossvein on the fore wing and near the third on the hind wing. Males have stigma of front wing remote from margin and have a dorsal apical process on tenth abdominal segment. Only one species occurs in Oklahoma and it is widespread.

Anomalagrion hastatum (Say) (Figs. 3A, 4E, 9C)

Body Length: 25 to 30 mm.

Wing Span: 22 to 25 mm.

Male: Labrum yellow, clypeus black; anterior part of face yellow, posterior part black with two postocular pale green spots, ventral surface of head pale. Dorsum of thorax black to blue-green with light green antehumeral pale stripe, lateral suture with a dark spot at the posterior end; front wings with the stigma removed from the margin by one cell and different from the stigma of front wing, Cu_2 of both wings closer to third postnodal crossveins. Abdomen of male yellow with dorsal surface of segments one and two black, segments three to six with black area reduced to a small basal and apical spots with at most a thin line of black between the two spots, segment seven with dorsum mostly black, segments eight to ten mostly brown, ventral surface of abdomen yellowish, segment ten with a dorsoapical bifid process; superior anal appendages bifid with inner process or arm pointing inward and the outer process pointed and straight, the inferior anal appendages curved slightly inward and upward with the tip black.

Female: Head and thorax similar to male. Abdomen with segments one to five yellow, segments six to nine brownish with black dorsal markings, segment ten entirely brown; ovipositor brown and extending beyond apex of abdomen, stylets contiguous at base and apex. Wings with stigma not removed from margin.

County Records: Alfalfa, Carter, Cleveland, Comanche, Cotton, Delaware, Garvin, Harmon, Hughes, Johnston, Latimer, LeFlore, McClain,

McCurtain, McIntosh, Marshall, Murray, Muskogee, Oklahoma, Okmulgee, Pittsburg, Sequoyah, Washita, Woods, Woodward.

Argia Rambur

This genus contains median to large size damselflies that are distinguished by having the anterior row of spines of middle and hind tibia generally twice as long as the interval between them and wings with one row of cells behind Cu_2 . This is the second largest genera of damselflies occurring in Oklahoma with 11 species.

Argia alberta Kennedy (Fig. 4I)

Body Length: 29 to 33 mm.

Wing Span: 38 to 42 mm.

Male: Head pale except black from front of ocelli to back of ocelli and extending to margin of each eye. Prothorax pale with dorsum black and thin black lateral stripe. Thorax with middorsal black stripe slightly narrower than pale antehumeral stripe; humeral stripe narrow and split midway; second lateral suture black on posterior or basal one-fourth, third lateral suture thin black line. Remainder of thorax pale gray to bluish. Legs pale with lateral and dorsal stripes on femur, tibia with ventral surface black. Abdominal segments as follows: one blue with black basal spot on dorsum, two blue with narrow lateral stripe expanding to subapical spot, three to six blue with subdorsal black stripe extending almost to black basal ring, seven blue with dorsum entirely black, eight and nine entirely blue, ten blue with lateroapical black band and deep apical dorsal notch. Superior

anal appendages dark brown with apex pointed ventrally, inferior anal appendages almost bifid and blunt at apex.

Following characteristics of this species are according to Needham and Heywood (1929).

Female: Color as in male but with blue of the head and thorax paler. Humeral stripe narrower. Abdomen pale with a narrow apical band on segments two to six, an apical dorsal spot, a lateral stripe and an oblique spot on the lower apical angle of the black sides, seven with dorsal half or more black, eight and nine with dorsolateral black stripe and ten entirely pale.

County Records: Alfalfa, Beaver, Cimarron, Comanche, Ellis, Harmon, McClain, Murray, Texas, Woods.

Argia agrioides Calvert (Fig. 5C)

Body Length: 32 to 35 mm

Wing Span: 38 to 42 mm.

Male: Head blue to violet with a black band running across head between eyes and through posterior ocelli. Prothorax pale with median black stripe. Thorax with thin middorsal stripe; humeral stripes brown and split on posterior half with the part along humeral suture a hairline, black stripe along lateral sutures a hairline; legs light color with lateral dark stripe on femur and anterior dark stripe on tibia with black spines. Abdominal segments one to six blue with apical dark ring, seven almost entirely black, eight to ten entirely pale or blue; inferior anal appendages longer than superiors, superiors

with apex bilobate or trilobate. Color may vary from blue to brown.

Female: Head pale brown to greenish with dark band on sides of ocelli and back of head. Prothorax with two middorsal dark spots and a rounded caudal margin. Thorax with middorsal carina pale, middorsal dark stripe narrow, humeral stripe a hairline in the middle and lateral stripe a hairline. Abdomen similar to male with dark areas smaller and semilateral postdorsal dark stripes on segments three to six; ovipositor reaching apex of abdomen and stylets dark and divergent.

County Records: Alfalfa, Beaver, Cleveland, Comanche, Custer, Harper, Jackson, Johnston, Latimer, Love, Marshall, Murray, Pushmataha, Woodward.

Argia apicalis (Say) (Fig. 5A)

Body Length: 32 to 36 mm.

Wing Span: 42 to 46 mm.

Male: Head entirely brown with darker areas present. Thorax brown with middorsal carina darker brown, dark brown humeral suture and lateral suture present; legs brown with black spines. Abdominal segments one to seven dark brown on dorsum with a light middorsal and basal band, segments eight and nine mostly dark, segment ten without dark markings; superior anal appendage with two teeth, one pointing ventrad and the other pointed laterad; inferior anal appendage bifid with the superior and inferior arms equal in length.

Female: Color similar to the male but a little lighter. Abdominal segments one to five with only latrodorsal dark stripes remainder of

segments same as male. Ovipositor extending to apex of abdomen, ventral margin of valvae smooth, stylets divergent.

County Records: Alfalfa, Adair, Atoka, Beckham, Beaver, Blaine, Bryan, Caddo, Canadian, Carter, Choctaw, Cleveland, Comanche, Cotton, Craig, Custer, Delaware, Grant, Harper, Haskell, Hughes, Johnston, Kiowa, Latimer, McClain, McCurtain, Major, Mays, Murray, Oklahoma, Osage, Pawnee, Payne, Pittsburg, Pottawatomie, Pushmataha, Texas, Tillman, Wagoner, Washington, Washita.

Argia bipunctulata (Hagen) (Fig. 5C)

Body Length: 24 to 26 mm.

Wing Span: 25 to 27 mm.

Male: Lower half of head below base of antennae blue, remainder of head black except thin blue line around occiput. Prothorax black on dorsum with an anterior blue band and lateral blue spot. Thorax black on dorsal half with a thin blue antehumeral stripe, lower part pale with thin dark stripe along lateral suture. Legs bluish with posterior and lateral apical half of femur dark, tibia with a dark anterior stripe, tarsi black. Abdominal segments as follows: one to five blue with subapical or apical brown spot or band, six and seven mostly black on dorsum, eight to ten almost completely blue or pale. Anal appendages about equal length, the inferiors bifid.

The female characteristics are from Needham and Heywood (1929).

Female: Head and thorax as in male. Abdomen with the dorsum of four to seven and nine and ten brown or black except for narrow

interrupted basal ring on four to seven, sides of one to five as in male, six to ten mostly black. Segment eight entirely blue on dorsum.

County Record: Latimer, McCurtain, Marshall, Muskogee

Argia immunda (Hagen) (Fig. 50)

Body Length: 36 to 40 mm.

Wing Span: 48 to 52 mm.

Male: Head pale except for black band across head at ocelli. Prothorax pale with black middorsal and thin lateral stripes. Thorax mostly pale, middorsal carina and stripe black, humeral black stripe forked midway; lateral stripe a thin hairline; legs dark with pale stripes. Abdominal segments two to six mostly pale with dark apical band and subbasal lateral black stripe, segment seven mostly black on dorsum, eight to ten pale on dorsum with lateral apical dark spot. Anal appendages about equal in length and shorter than the length of segment ten, inferiors with apices pointed dorsally.

Female: Color and markings same as male except dark areas reduced in size. Ovipositor reaching apex of abdomen, stylets short and straight.

County Records: Caddo, Cleveland, Comanche, Garvin, Jackson, Johnston, Latimer, Marshall, Murray, Pushmataha, Washita.

Argia moesta (Hagen) (Fig. 5E)

Body Length: 38 to 46 mm.

Wing Span: 43 to 53 mm.

Male: Head mostly black with anteriolateral area and labrum brown. Prothorax black; thorax with middorsal black stripe wider than antehumeral pale stripe, lateral and ventral surface varies from pale green to dark brown; legs dark on outer margin, light on inner margin, spines pale, wings with brown stigma surmounting two or more cells. Abdominal segments one to three dark with lighter stripes on lateral aspects of dorsum, segments four to ten dark brown to black with basal pale band; anal appendages shorter than tenth segment, superior appendage not bifid and inferior appendage lacking tubercles.

Female: Head greenish with brown spot behind posterior ocelli. Prothorax green with brown markings; meso- and metathorax entirely green except black middorsal carina and humeral black stripe which is enlarged at the ends and a hairline in the middle; legs light with brown line on outer margin; stigma of both wings surmounting two or more cells. Abdomen pale except dark stripe on lateral margin of dorsum decreasing toward the apex; ovipositor not reaching to the end of the abdomen, stylets about one-fifth the length of the ovipositor, ventral margin of valvae not serrated.

County Records: Alfalfa, Adair, Bryan, Carter, Cherokee, Cimarron, Cleveland, Craig, Custer, Delaware, Greer, Jackson, Johnston, LeFlore, McClain, McCurtain, Marshall, Mays, Murray, Muskogee, Oklahoma, Osage, Pawnee, Payne, Pittsburg, Pushmataha, Texas.

Argia sedula (Hagen) (Figs. 5F, 9D)

Body Length: 32 to 35 mm.

Wing Span: 38 to 40 mm.

Male: Most of head bluish-gray except black around ocelli and antennae. Prothorax black except a humeral blue spot and ventral bluish margins. Thorax with middorsal black stripe as wide as antehumeral light stripe, humeral black stripe split on posterior one-sixth and about as wide as antehumeral pale stripe, ventral half of thorax light except thin stripe along lateral suture; legs light with lateral brown stripe on femur and anterior brown stripe on tibia. Abdominal segments as follows: one entirely blue; two brown dorsally, with basal half blue, three to seven brown dorsally with basal blue spot extending three-fourths to the apex laterally, eight to ten blue dorsally, brown on ventral part; inferior anal appendages bifid and longer than the superiors.

Female: Head, prothorax and thorax brown color except middorsal carina very thin humeral stripe and lateral stripe dark. Legs similar to male. Abdominal segments one to seven brownish with pale area on side and apically, segment eight to ten mostly brown; ovipositor reaching to apex of abdomen, valvae not serrated, stylets short.

County Records: Alfalfa, Atoka, Beckham, Caddo, Carter, Cleveland, Custer, Greer, Johnston, McCurtain, Major, Marshall, Murray, Muskogee, Sequoyah, Washita, Woods.

Argia tibialis (Rambur) (Fig. 5G)

Body Length: 28 to 32 mm.

Wing Span: 48 to 52 mm.

Male: Lower half of head from base of antennae pale brown to purplish, remainder of head black, base of postclypeus with black band. Prothorax black. Thorax with thin middorsal black stripe joined posteriorly with humeral black band, humeral black stripe wide and extending to second lateral suture, third lateral suture dark, remainder of thorax pale brown to yellow. Legs dark except pale stripe on dorsal surface of tibia. Abdominal segments as follows: one to three black with thin middorsal pale stripe, four to seven black with basal pale ring and middorsal pale stripe, eight entirely black, nine blue on dorsal and lateral sides, black ventral stripe present, ten black with large blue subdorsal basal spot. Superior anal appendage dark and short, inferior anal appendages bifid and longer than the superiors, black on outer surface and pale on mesal surface.

Female: Head pale except postocular area which is dark with light postocular spots. Prothorax and thorax pale greenish except dark middorsal stripe and humeral stripe which is split on caudal fourth. Legs mostly pale with dark lateral stripe. Wings almost as long as abdomen. Abdominal segments one to nine with thin pale basal band and median stripe, remainder of dorsum dark, ten mostly pale. Ovipositor reaching end of abdomen, valvae not serrated.

County Records: Adair, Atoka, Bryan, Caddo, Choctaw, Craig, Delaware, Haskell, Johnston, Latimer, LeFlore, McCurtain, Mays, Murray,

Pittsburg, Pushmataha, Sequoyah, Wagoner.

Argia translata Hagen (Fig. 5H)

Body Length: 34 to 36 mm.

Wing Span: 44 to 46 mm.

Male: Labrum, anteclypeus and postocular spots pale, remainder of head black, Prothorax black. Dorsal half of thorax black except for incomplete antehumeral and posthumeral pale stripes, stripe along lateral suture black; legs mostly black. Abdominal segments black on dorsum with pale basal ring; segments eight and nine with basal ring from one-fourth to one-half the length of the dorsum, segment ten entirely black. Superior anal appendages not bifid and shorter than inferiors.

Female: Labrum greenish with basal median dark spot, anteclypeus and front of head pale, postclypeus and posterior part of head black with green postocular spots. Prothorax mostly black, mesostigmal laminae with median tubercles on posterior edge. Thorax with middorsal stripe black and wider than antehumeral pale stripe, humeral area with black stripe dorsally and pale stripe ventrally, anterior part of black stripe joined with posthumeral black stripe, lateral suture with black stripe fading anteriorly; legs light with dark stripe laterally. Abdominal segments one to seven with pale basal band, segments one to five with thin median dorsal pale stripe and sublateral pale stripe, remainder of segments dark dorsally. Ovipositor reaching apex of abdomen, valvae serrated slightly.

County Records: Delaware, Johnston, Latimer, McCurtain, Murray, Muskogee.

Argia violacea (Hagen) (Fig. 5I)

Body Length: 33 to 37 mm.

Wing Span: 40 to 44 mm.

Male: Head violet with black markings, labrum brown. Thorax violet with middorsal stripe black and half as wide as violet antehumeral stripe, humeral black stripe wider in front than behind, lateral stripe thin anteriorly, ventral and anterior parts white; legs white with outer black stripe and black spines. Abdomen violet-brown with black markings on sides near apex of segments two to four; segments five to six with more black on sides, segment seven almost entirely black, segments eight to ten brown with black stripe on ventral surface; anal appendages shorter than tenth segment, superior anal appendage shorter than inferior appendages which are about as wide as long and almost bifid.

Female: Head brown with black markings. Thorax same as in male except pale areas are brown. Legs brown. Abdomen similar to male but with less black and light areas are brown; ovipositor extending beyond apex of abdomen, ventral margin of valvae serrated, stylets about one-fourth length of ovipositor.

County Records: Alfalfa, Cimarron, Cleveland, Comanche, Custer, Greer, Johnston, Latimer, LeFlore, McClain, McCurtain, Marshall, Murray, Muskogee, Oklahoma, Pawnee, Pushmataha, Wagoner, Washita, Woods.

Argia vivida Hagen (Fig. 5J)

Body Length: 38 to 42 mm.

Wing Span: 48 to 52 mm.

Male: Entire head bluish violet except black stripes on dorsal part. Dorsum of prothorax black except small medioposterior violet spot and large lateral violet spots; thorax with middorsal stripe black, antehumeral pale stripe twice as wide as humeral black stripe, humeral black stripe irregular in width, wider at anterior and posterior ends. Dorsum of abdominal segments as follows: one entirely blue; two to six with dark area on apical fourth or less, seven almost entirely black, eight to ten blue; superior anal appendages decurved and slightly expanded at apex, inferior anal appendage bifid with arms equal in length.

Female: Head similar to male except brownish. Prothorax brown with middorsal stripe black; thorax with mddorsal black stripe half the width of the antehumeral pale stripe, humeral stripe thin, narrower in the middle than at the ends; legs light, with dark posterior stripe on femur. Abdominal segment one entirely light, two to six pale with apical dark spot and lateral subbasal stripe not reaching apex, segment seven with subbasal lateral stripe reaching apex, segments eight to ten entirely pale; ovipositor short, one-fourth the length of segment seven.

County Records: Alfalfa, Blaine, Caddo, Carter, Cimarron, Cleveland, Comanche, Custer, Delaware, Ellis, Johnston, Latimer, Major, Marshall, Murray, Muskogee, Pawnee, Payne, Pontotoc, Washita, Woods, Woodward.

Hyponeura Selys

These are large, dull colored, heavily built, clear winged damselflies with the anterior row of spines of the middle and hind tibia generally twice as long as the interval between them. Wings are stalked almost to the anal crossvein and have two distinct rows of cells behind Cu_2 . This genus contains a single species occurring in the extreme western region.

Hyponeura lugens (Hagen) (Figs. 3F, 7A, 9H)

Body Length: 48 to 52 mm.

Wing Span: 65 to 68 mm.

Male: Head dark with fine hairs, eyes orange. Prothorax dark with few light brown spots. Thorax mostly dark with interrupted light stripes along black middorsal carina, middorsal black stripe narrower than light brown antehumeral stripe, humeral stripe divided into a large triangle anteriorly and a small light spot posteriorly, remainder of thorax dark with few light patches. Wings long and stalked almost to the anal crossvein. Legs brown with darker brown spots. Abdominal segments as follows: one brown with dark lateral stripe, two dorsum light brown, sides with black stripe, three to eight brown with lateral black stripe expanding into apical ring, nine with thin middorsal light brown line, dark subdorsal stripe, ten entirely brown. Superior anal appendages small and ventrally curved apex, inferior anal appendages large and flattened.

Female: Head light except for dark stripe from eye to eye behind

ocelli, postocular spots black. Prothorax pale with subdorsal and lateral black stripes. Thorax brown with middorsal carina black bordered by thin light stripe and narrower middorsal black stripe, pale antehumeral stripe wide, humeral black stripe divided almost entire length, second lateral suture with posterior dark spot, third lateral suture black. Legs and wings same as male. Abdominal segments One to seven same as in male, except with greater contrast between dark and light parts; eight and nine light with subdorsal basal spot, ten entirely light. Ovipositor reaching apex of abdomen, valvae serrated and stylets dark.

County Records: Cimarron, Comanche.

Nehalennia Selys

These are very small damselflies with the dorsal parts of the head, thorax and abdomen greenish black. They can be identified by characters given in the keys. This genus has only one species recorded from southeast Oklahoma.

Nehalennia intergricollis Calvert (Fig. 9J)

Body Length: 24 to 26 mm.

Wing Span: 29 to 31 mm.

Male: Head dark brown to black with dorsal surface with metallic green tinge. The second antennal segment has a pale median band, the third segment twice as long as the first and second combined. The thorax with dorsal half dark with metallic green coloring, the ventral

half pale. Legs pale with two dark stripes on outer surface of femur and one stripe on outer surface of tibia. Abdomen with the dorsal half brown with metallic green sheen, becoming less noticable toward the apex, the ventral half pale. Ninth segment with a pale blue triangular spot on the dorsum and segment ten entirely light blue with a short dorsoapical projection. Superior anal appendages shorter than the inferiors.

Female: Color and markings similar to male except with yellow appendages. The ovipositor extending a very short distant beyond apex of tenth segment, stylets short.

County Records: Pushmataha.

Teleallagma Kennedy

Needham and Heywood (1929) says these are very long slender and pale damselflies in which the wings are stalked generally to the anal crossvein. Pale postocular spots are present. Only one species has been recorded from southeast Oklahoma.

Teleallagma daeckii (Calvert)

Body Length: 36 to 38 mm.

Wing Span: 40 to 44 mm.

Characteristics of the male of this species are from Needham and Heywood (1929).

Male: Long thin pale bluish species with obscure black markings

and an extremely long abdomen. Face blue with few black dots. Top of head black with a pair of large triangular pale blue postocular spots. Front of thorax with carina black and narrowly bordered with black, humeral stripe interrupted. Sides pale with a short narrow line at the upper end of second lateral suture. Legs pale with a black stripe on all femora above and one on outside and front of tibia. Abdominal segments one to six with a blackish middorsal stripe widening before the apex, seven with black covering three-fourths of dorsum, apex of seven and eight to ten pale blue. Superior anal appendages black, truncate, and with a ventral subapical rounded notch. Inferior anal appendages shorter than the superiors and pointed posteriorly.

Female: Head and thorax similar to male. Legs pale with sub-apical black ring on femur and black spots on lateral surface of tibia. Abdominal segments as follows: one pale with interrupted black stripes on dorsum, two to seven pale with dorsum dark, dark stripe is narrower on basal fourth, eight pale with dorsum dark, which is narrowed on apical end, nine and ten entirely pale gray.

County Record: Pushmataha.

Telebasis Seyles

These are small red damselflies with a slender body. They can be identified by characteristics given in the key. Only one species has been recorded from the southern half of the state.

Telebasis salva Hagen (Fig. 7G)

Body Length: 27 to 30 mm.

Wing Span: 28 to 32 mm.

Male: Head with anterior half brown to rust color, labrum from yellow to reddish, the posterior half of head bronze-green. Thorax with middorsal stripe bronze-green to black, middorsal carina reddish-brown, a post humeral bronze-green spot present midway from ends in some specimens, remainder of thorax pale brown to rusty red; legs same as thorax with black spines. Abdomen light brown to red, more red toward end of abdomen; superior anal appendages shorter than the inferiors, both pointed and with dark apices.

Female: Markings and color same as in male. Ovipositor almost reaching apex of abdomen, stylets not contiguous and pointed ventrally.

County Records: Cleveland, Custer, Love, McClain, Marshall, Murray, Oklahoma, Payne, Tillman.

Enallagma Charpentier

This is the largest genus of damselflies with 13 species recorded from throughout the state. This genus contains the bright blue and black damselflies. They can be identified by having short spines on anterior surface of middle and hind tibia, pale postocular spots on head, stigma of fore and hind wing of male similar, ventral spine on abdominal segment eight of female present and M_2 generally originating near the fifth postnodal crossvein on the front wing and near the

fourth on the hind wing.

Enallagma antennatum (Say) (Fig. 5K)

Body Length: 32 to 36 mm.

Wing Span: 38 to 42 mm.

Male: Labrum, anteclypeus and frons orange, remainder of head black except green postocular spots joined by bluish-green band. Prothorax black on dorsum with anterior margin, two median and lateral spots blue, dorsal aspects of thorax black except thin antehumeral yellow stripe not reaching posterior margin; legs pale with lateral dark stripes or a row of spots on femur and tibia; tarsi pale. Abdominal segments as follows: one blue laterally with thin apical band, dorsum black, two to eight and ten blue or light laterally and black on dorsum from base to apex; nine mostly blue with two subapical black spots and a thin black band; superior anal appendages large, bifid with arms equal and divergent.

Female: Color and markings similar to male; except median blue spot on thorax wanting; mesostigmal plate with median and lateral yellow spots. Dorsum of abdominal segment nine entirely black. Ventral apex of segment with a spine; ovipositor not reaching apex of abdomen, valvae not serrated.

County Records: Alfalfa, Cimarron.

Enallagma aspersum (Hagen) (Fig. 6A)

Body Length: 28 to 32 mm.

Wing Span: 38 to 42 mm.

Male: Head mostly blue, black on postclypeus and wide black band on head from base of antennae to just behind ocelli. Prothorax black on dorsum with a blue lateral spot. Thorax mostly blue except mid-dorsal and humeral black stripes; legs light medially, black on outside. Abdominal segments as follows: one, eight and nine entirely pale blue to violet, two with dorsal apical black spot, three to six and ten black three-fourths or more of dorsum, seven black only on basal half of dorsum; superior anal appendages bifid, with the superior arm twice as long as inferior arm, inferior anal appendage with apex pointed mediodorsally.

Female: Color and markings similar to male except as follows: abdominal segments one black on basal half, two to six and ten black or dorsum, seven mostly pale with apical band and very thin middorsal stripe, eight black on apical half and narrower on basal half, a ventral apical spine on segment seven. Ovipositor short, almost reaching apex of abdomen, valvae serrated, stylets short.

County Records: Latimer, Marshall.

Enallagma basidens Calvert (Figs. 6B, 9E)

Body Length: 23 to 28 mm.

Wing Span: 25 to 30 mm.

Male: Labrum, anteclypeus, front of head to base of antenna and

postocular spots blue, remainder of head black. Dorsum of prothorax black except anterior margin and lateral spots blue; thorax with middorsal stripe black with carina blue, antehumeral blue stripe half the width of the middorsal stripe, humeral stripe split by blue most of its length, remainder of thorax blue; legs white with posterior margin of femora dark brown; wings with M_2 originating between fourth postnodal crossvein in front wing and third postnodal crossvein in hind wing. Dorsum of abdominal segments one to three with black stripe from base to apex, four to six with apical half black, seven and ten almost entirely black, eight blue with only small basal black spot and nine entirely blue, remaining parts blue. Superior anal appendages bifid with inferior arm shorter than superior arm, inferior anal appendage shorter than superior appendages.

Female: Markings are the same as male, color is light brown with dark brown to black markings. Abdominal segments one to seven same as male, eight with dorsum entirely dark brown, segments nine and ten gray, nine with basal brown spots and a ventral apical spine; ovipositor not reaching apex of abdomen, stylets short.

County Records: Alfalfa, Beaver, Carter, Choctaw, Cleveland, Comanche, Ellis, Greer, Harper, Jackson, Johnston, Latimer, LeFlore, McClain, Marshall, Murray, Muskogee, Oklahoma, Okmulgee, Osage, Pawnee, Texas, Tillman, Washita, Woods, Woodward.

Enallagma carunculatum Morse (Fig. 6C)

Body Length: 30 to 32 mm.

Wing Span: 36 to 40 mm.

Male: Labrum, anteclypeus and lower part of head pale, remainder of head black, postocular spots green and not connected to the pale postocellar stripe. Prothorax black with pale anterior and posterior margins and lateral pale spots. Thorax with middorsal stripe and pale antehumeral stripe about equal in width, humeral black stripe thin over mesinfraepisternum, wider along mesepimerion and becoming narrower toward base of fore wings. Remainder of thorax pale except black spot on third lateral suture. Legs pale with dorsal surface of femur and lateral surface of tibia black. Abdominal segments as follows: one blue with basal black spot, two blue with dorsal round apical black spot, three to seven blue with dorsal black stripe on apical one-half to three-fourths, eight and nine entirely blue, ten entirely black on dorsum, pale on lateroventral half. Superior anal appendage bifid and with a median tubercle also with superior arm longer than the inferior arm, inferior anal appendages short with the apex pointed dorsomedially.

Female: Head markings similar to male. Prothorax black with pale lateral stripes. Mesostigmal laminae with a diagonal ridge. Thorax similar to male except antehumeral black stripe narrower on posterior end and variable in width throughout. Abdominal segment one pale with black basal spot, segments two to seven pale laterally, black on apical three-fourths of dorsum. Ovipositor not reaching end of abdomen, valvae not serrated.

County Records: Cimarron.

Enallagma civile Hagen (Figs. 1A, 3C, 6D)

Body Length: 28 to 35 mm.

Wing Span: 38 to 44 mm.

Male: Labrum light brown, anteclypeus, front of head to base of antennae, and postocular spots light blue; postclypeus and remainder of head black. Prothorax black on dorsal surface with light spots along lateral edge of black; thorax with middorsal stripe black, antehumeral stripe blue and narrower than middorsal stripe and twice as wide as humeral black stripe; remainder of thorax blue except black spot on the dorsal end of the second lateral suture. Abdominal segment one blue with basal black spot, segments two to five blue with apical black spot on dorsum less than half the length of the segment, segments eight and nine entirely blue, ten with dorsal black spot; superior anal appendage bifid with superior and inferior arms equal, median tubercle present between the arms; inferior anal appendages shorter than superior anal appendages.

Female: Markings similar to male except abdomen, color brown to yellow rather than blue. Black dorsal stripe covering entire length of all abdominal segments except basal margin of segments three to seven, light part of abdomen brown; apical spine present on ventral aspect of segment eight.

County Records: Alfalfa, Beckham, Blaine, Caddo, Canadian, Carter, Cleveland, Cherokee, Cimarron, Comanche, Cotton, Custer, Garvin, Grady, Harmon, Hughes, Jackson, Johnston, Kay, Kiowa, Latimer, LeFlore, Love, McClain, McCurtain, Major, Marshall, Murray, Muskogee, Oklahoma, Payne,

Pittsburg, Pontotoc, Pottawatomie, Stephens, Tillman, Washita, Woods, Woodward.

Enallagma clausum Morse (Fig. 6E)

Body Length: 28 to 32 mm.

Wing Span: 36 to 38 mm

Male: Head black except labrum, anteclypeus, anterior ridge of postclypeus and postocellar spots which are pale greenish. Prothorax black except lower side and small antehumeral spot. Thorax with middorsal black stripe half as wide as antehumeral pale stripe. Humeral black stripe of irregular width but never as wide as middorsal black stripe and connected to it by a black posterior band. Legs pale on inner surface, black on outer. Abdominal segments as follows: one blue with black dorsal spot, two to seven blue with variable apical black spot increasing in coverage from one-half to three-fourths length of dorsum posteriorly, eight and nine entirely pale and ten entirely black on dorsum. Superior anal appendage short and slanting ventrally. Inferior anal appendages longer than superiors and curved dorsally.

Female: Similar to male, except the apical black spot on abdominal segments three to seven occupying the greater part of the dorsum, but not reaching the basal margin. Segment eight entirely pale blue, dorsum of nine and ten entirely black.

County Records: No recorded from Oklahoma but from Morton and Scott counties of Kansas.

Enallagma divagans Selys

Characteristics of this species are from Needham and Heywood (1929).

Body Length: 29 to 33 mm.

Wing Span: 40 to 42 mm.

Male: Face blue, labrum pale except black median spot, postclypeus black, antennae black, remainder of head black except postocular spots which are pale and not connected. Prothorax black with spots of varying size. Thorax with middorsal and humeral dark stripe wide, antehumeral pale stripe narrower than both; a short black basal line or spot on second and third lateral sutures. Abdomen blue-bronze, black on dorsum as follows: one a basal spot, two to seven and ten entire dorsum, eight and nine entirely blue except for an occasional minute isolated black spot on the sides. Superior anal appendages black, comma shape, shorter than tenth segment and not bifid.

Female: Similar to male except eighth abdominal segment which is black on the dorsum with pale lateral spot on the caudal margin, segment nine blue with two short dorsolateral black stripes fused at the base of the meson, ten entirely blue.

County Records: Comanche, Latimer, LeFlore, McCurtain, Mays, Pushmataha.

Enallagma dubium Root

Characteristics of this species are from Needham and Heywood (1929).

Body Length: 34 to 38 mm.

Wing Span: 34 to 36 mm.

Male: Color metallic black and yellow. Head pale beneath, postclypeus black, front of head pale to base of antennae which are entirely black. Postocular spots pale and broadly separated from or joined with pale postocellar stripe. Prothorax mainly black, a transverse yellow band on the anterior margin, pale spot on posterolateral fourth and lower sides yellow. Thorax with wide middorsal black stripe, very narrow pale antehumeral stripe and wide black humeral stripe; remainder of thorax pale except for third lateral suture with a black stripe. Abdomen with dorsum of all segments black, except for a very narrow apical or basal ring. Sides and venter orange or yellow. Superior anal appendages longer than tenth segment and not bifid.

Female: Unknown.

County Records: Pushmataha.

Enallagma exsulans (Hagen) (Figs. 6F, 9F)

Body Length: 34 to 38 mm.

Wing Span: 34 to 36 mm.

Male: Lower half of labrum, anteclypeus and front of head to base of antennae bluish-green, base of labrum postclypeus and remainder of head black except postocular spots which are bluish and joined by a thin blue band. Dorsum of prothorax black with median and lateral and medioposterior spots and anterior margin blue. Thorax with middorsal

black stripe about same width as antehumeral pale stripe, remainder of thorax bluish-green except short black stripe on posterior one-fourth of second lateral suture; third lateral suture a dark hairline; legs light with two dark stripes or a dark stripe and spots on femur and a single line of dark spots on tibia, tarsi light. Abdominal segments as follows: one to two blue laterally, black dorsally; three to seven blue laterally and short basal band, dorsum black, narrow basally; eight blue with a basal triangular black spot on dorsum; nine entirely blue; ten blue laterally, black dorsally. Superior anal appendages bifid with the inferior arm longer than the superior arm, inferior anal appendages with tapering apex.

Female: Markings similar to male, color pale. Humeral stripe of thorax narrower than antehumeral dark band. Abdominal segments one to eight black on dorsum, nine pale with a pair of dark dorsal spots at the base, ten entirely pale. Ovipositor not reaching apex of abdomen, stylets short and straight.

County Records: Cleveland, Choctaw, Delaware, Haskell, Johnston, Latimer, LeFlore, McClain, McCurtain, Marshall, Murray, Osage, Pawnee, Payne, Pushmataha.

Enallagma geminatum Kellicott (Fig. 6G)

Body Length: 24 to 28 mm.

Wing Span: 28 to 32 mm.

Male: Labrum, anteclypeus frons and postocular spots bluish-green remainder of head black. Prothorax black on dorsum except anterior and

posterior margins blue. Thorax with middorsal black stripe contiguous posteriorly with humeral black stripe and as wide as antehumeral blue stripe which doesn't reach the posterior margin. Legs light with lateral dark stripe and tarsi black. Abdominal segments as follows: one blue with a basal black spot on dorsum, two blue with a diamond shape black apical spot on dorsum, three to six bluish laterally and thin basal ring, dorsum black, seven and ten black on dorsum, eight and nine entirely blue on dorsum with black stripe laterally. Superior anal appendage not bifid and shorter than inferior anal appendages.

Female: Markings of head and thorax same as in male. Color varies from violet to blue. Abdomen differs from male as follows: two to seven black on dorsum from base to apex, narrower at base than apex, eight with large dorsolateral blue spot, middorsal black stripe narrower basally expanding apically, ventrolateral margin black; nine and ten entirely black dorsally with a narrow pale apical ring beyond apices. Ventral apical spine on segment eight, ovipositor reaching to apex of abdomen.

County Records: Alfalfa, Comanche, LeFlore, Mays, Murray, Pushmataha.

Enallagma praevarum (Hagen) (Fig. 6H)

Body Length: 29 to 31 mm.

Wing Span: 32 to 34 mm.

Male: Labrum, anteclypeus, anterior margin of postclypeus, lower front of head below base of antennae, large postocular spots and

postocellar stripe blue; remainder of head black. Prothorax black with pale anterior and posterior margins, anterior spot, mediolateral spot and lower sides. Thorax with dorsum black enclosing blue antehumeral stripe which is as wide as middorsal black stripe and twice as wide as humeral black stripe. Remainder of thorax pale except posterior fourth of third lateral suture. Legs pale with black stripe on posterior surface of femur and lateral surface of tibia. Abdominal segments as follows: one blue with square basal spot, two blue with black spot on apical half, three blue with stripe on dorsum beginning midway and expanding into an apical band, four to seven blue with three-fourths or more of dorsum black, eight and nine entirely pale, ten entirely black on dorsum. Superior anal appendages bifid, with superior arm longer than the inferior arm, and as long as posteriorly directed inferior anal appendages.

Characteristics of the female are from Needham and Heywood (1929).

Female: Similar to male. Abdomen with the dorsum of two to ten black, black of segment one not reaching apex.

County Record: Cimarron.

Enallagma signatum (Hagen) (Fig. 6I)

Body Length: 30 to 34 mm.

Wing Span: 34 to 38 mm.

Male: Color in teneral specimens may be more bluish than yellow. Clypeus, except basal band, anteclypeus, lower front of head including base of antennae yellow; remainder of head black except small ocellar

yellow spots and postocular spots which are joined by an ocellar yellow band. Prothorax black with ventrolateral edge, lateral spots, middorsal pair of spots, anterior and posterior margins yellow. Thorax with middorsal stripe and pale antehumeral stripe about equal in width; humeral stripe about half as wide as antehumeral; the remainder of thorax yellow except black spot on second lateral suture and third lateral suture a hairline with a black spot on posterior end. Legs pale with black spines. Abdominal segments yellow with black on dorsum as follows: one entirely black except pale thin apical ring, two entirely black, three to seven with black dorsal stripe narrow basally and with a subapical pale notch, eight entirely black, nine entirely yellow with black spines, ten mostly yellow with dorsal black stripe wide basally and narrow apically. Superior anal appendage longer than tenth segment and with a subapical ventral tooth; inferior anal appendage half the length of the superiors with apex curved medially.

Females: Color and markings similar to male. Prothorax with large dorsal pits present. Thorax with humeral stripe uneven width throughout, narrow anteriorly and posteriorly. Abdominal segments one to seven black on dorsum, eight black on dorsum with pale apical ring, nine pale with small basal black spot, ten entirely pale. Ovipositor not reaching apex of abdomen.

County Records: Alfalfa, Cleveland, Comanche, Harmon, Harper, Latimer, LeFlore, McClain, Marshall, Mays, Murray, Muskogee, Woodward.

Enallagma traviatum Selys (Fig. 6J)

Body Length: 30 to 34 mm.

Wing Span: 34 to 38 mm.

Male: Head pale except black around ocelli to base of antennae and along margin of eye and surrounding postocular spots. Prothorax black with anterior fourth, lower sides, lateral and middorsal spots and caudal margin pale. Thorax pale with middorsal black stripe half as wide as antehumeral pale stripe and humeral stripe a thick hairline with large spot on caudal end, second lateral suture dark on caudal fourth or less, third lateral suture a hairline. Legs pale with black stripe on dorsal surface of femora. Abdominal segments as follows: one blue with large square basal dark spot and a small apical spot, two blue with dorsal stripe extending from base and expanding to large subapical spot, three to seven with dorsum mostly black, eight and nine entirely pale, ten with dorsum black. Superior anal appendage bifid with widely divergent arms; the superior arm much larger than the inferior arm. Inferior anal appendages with blub-like base with small process directed posteriorly. Color from blue to violet.

Characteristics of the female are from Needham and Heywood (1929).

Female: Color and markings similar to male except thorax with middorsal carina often brown. Abdomen with a basal dark spot only, four to seven with narrow longitudinal dorsal black stripe, widened suddenly near the caudal margins and narrowed to the meson on the anterior margin, eight blue with a narrow dorsal stripe on the basal half or more, nine and ten entirely blue.

County Records: Latimer, LeFlore, McCurtain.

Enallagma vesperum Calvert (Fig. 6K)

Body Length: 31 to 35 mm.

Wing Span: 36 to 40 mm.

Male: Labrum, anteclypeus, front of head and antennae pale, remainder of head black except postocular spots which are joined. Prothorax pale with middorsal posterior spot narrowing anteriorly. Thorax pale except middorsal black stripe, humeral black line and black line on lateral suture. Abdominal segments one and two black dorsally from base to apex, three to six with dorsal black stripe not reaching base of segment, seven and eight entirely black on dorsum, nine entirely pale and ten pale with thin dorsal dark stripe and short dorsoapical dark band. Superior anal appendages bifid, shorter than tenth segment and longer than the medially pointed inferior appendages.

Characteristics of female are from Walker (1953).

Female: Head and thorax similar to male. Legs similar but usually with more distinct dark line on distal part of anterior surface of femur. Abdomen with almost the entire dorsum greenish metallic black with narrow yellow rings as follows: one apical margin, three to seven with basal pale ring not interrupted dorsally, dorsal black stripe expanding apically on the sides and confluent with the apical ring, eight black with narrow ventrolateral yellow margin, nine with large dorsal spot which narrows caudal, ten yellow. Mesostigmal laminae with a pair of tubercles at the posteriolateral angles.

County Records: Choctaw, LeFlore, McCurtain, Pushmataha.

Ischnura Charpentier

This genus contains mostly median to small damselflies. They can be identified by the M_2 vein which generally originates between the fourth postnodal crossvein on the fore wing and nearest the third (or second) on the hind wing. Postocular spots are usually present and the mesoplural suture usually has a distinct black stripe. Certain species of mature females exhibit dichromatism (Needham and Heywood, 1929). There exists two types of females based on color patterns. Homoechromatic females in which the basic colors are blue or green, and black generally same as in the male. Pale postocular spots are small and not contiguous with the pale color of the rear of the head. The predominant color of the thorax is pale blue.

Heterochromatic females have the major colors yellow or orange, and black. Pale postocular spots are more or less contiguous with the pale color of the rear of the head. The predominant color of the thorax is yellow or pale orange.

According to Needham and Heywood (1929) both forms when newly emerged have the eighth and ninth abdominal segments pale blue and with a short basal black stripe on each side of the segments, connected across the dorsum by a black basal line, wider on eight than nine.

Ischnura barberi Currie

Body Length: 27 to 31 mm.

Wing Span: 30 to 34 mm.

Male: Clypeus, except basal band, anteclypeus and front of head including base of antennae pale, remainder of head black except two ocellar spots, postocular spots, which are small and not joined, and postocellar stripe. Prothorax black on dorsum except cephalic and caudal margin, lateral half also pale. Thorax with middorsal black stripe and pale antehumeral stripe same width. Humeral stripe narrow over mesinfrsepisternum, wide along anterior mesepimerion and becoming narrower caudal; remainder of thorax pale except black spot on caudal end of third lateral suture. Legs pale with black stripe on posterior margin of femora, tibia with lateral dark stripe or row of spots, tarsi pale, claws with apex black. Abdominal segments pale on ventral and lateral parts. Dorsum as follows: one basal black spot only, two entirely black, three to six black narrow basally becoming wider subbasally and tapering to a narrow stripe subapical then wide apical spot, seven thin stripe basally widening to three-fourths of dorsum, eight entirely blue except small black basal spot, nine entirely pale, ten entirely black with bifid dorsoapical process. Superior anal appendage decurved, one-half the length of segment ten and with an acute curved apical process; inferior anal appendages nearly the length of segment ten and with an outer acute process.

Characteristics of the female are from Needham and Heywood (1929).

Female: Heterochromatic form - Similar to male except as follows: pale area of head much larger, transverse frontal band of yellow nearly reaching the median ocellus. Pale postocular spots wide and broadly joined to the yellow of the rear of the head. The dark middorsal and humeral thoracic stripe very narrow. Abdominal segments eight and nine broadly brown on dorsum. A well developed ventral apical spine

present on segment eight.

Female: Homoeochromatic form - Color and markings the same as in the male.

County Records: Alfalfa, Jackson, Woods, Woodward.

Ischnura damula Calvert

Some characteristics of the male are from Walker (1953).

Body Length: 29 to 31 mm.

Wing Span: 32 to 34 mm.

Male: Vertex and antennae black, postocular spots small, round and isolated, postocellar stripe absent. Postclypeus and basal line of labrum black, remainder of head pale green. Prothorax mostly black with anterior margin and median dorsolateral stripe pale. Thorax almost entirely black to humeral suture, antehumeral pale stripe indicated by two widely separated angular spots, sides pale greenish with a heavy black line on the second lateral suture. Legs black with flexor surface pale, tarsi dark brown above, paler beneath, with dark spots at joints. Stigma of fore and hind wings differ. Abdomen black and yellowish green. Dorsum of segments as follows: one with rectangular black spot reaching apex, two entirely black except pale apical ring, three to seven entirely black, small yellow basal spot may be present on four to seven, eight and nine blue with rectangular lateral black spots, ten entirely black. Superior anal appendages half as long as segment ten, with dorsal margin sloping ventrad, posterior margin rounded. Inferior anal appendages are sharply hooked mesad

at tips.

Characteristics of the female are from Walker (1953).

Female: Homoeochromatic form - Similar to male in color and markings.

Female: Heterochromatic form - Similar to teneral stage and differs from the homoeochromatic form mainly in the greater extent of the pale markings, especially those of the head and thorax and in color which is light brown. The postocular spots are joined across the occiput and widely confluent with pale yellow of rear of head. Dorsum of thorax with a broad black median stripe and pale antehumerals about half as wide, humeral stripes varying from merely a heavy line to a narrow stripe. Dorsum of abdominal segments as follows: one and two pale with middorsal black spot, three to seven black above with a narrow yellow basal ring, eight pale with lateral spots only, nine with spots confluent to form a single large spot enclosing a pale median spot, ten entirely pale.

County Records: Cimarron. Collected by A. E. Pritchard, 1933.

Ischnura demorsa (Hagen) (Fig. 7B-C)

Body Length: 24 to 26 mm.

Wing Span: 25 to 27 mm.

Male: Labrum, anteclypeus, lower part of head, postocular spots and postocellar stripe blue; remainder of head black. Prothorax black with wide blue band on anterior margin, thin blue band on posterior margin lateral stripe and lower sides blue. Thorax with black

middorsal stripe wider than antehumeral pale stripe which is half as wide as humeral black stripe, second lateral suture with a black spot on the posterior fourth, third lateral suture a hairline three-fourths its length; remainder of thorax pale. Legs pale with posterolateral stripe on femora, and a row of spots on lateral surface of tibia. Abdominal segments as follows: one black on dorsum with thin apical ring, two entirely black on dorsum, three to seven black on dorsum except basal pale ring, eight almost entirely pale with small lateral spot, nine entirely pale, ten black on dorsum with middorsal apical bifid process with pale tip. Superior anal appendages with tip decurved, inferiors bifid with superior arms at least twice as long as inferior arm.

Female: Markings of head and thorax similar to male. Abdomen with dorsum of all segments dark; ovipositor extending beyond apex of abdomen, valvae not serrated, stylets almost parallel.

County Records: Beaver, Cimarron, Harper, Texas, Woodward.

Ischnura denticollis (Burmeister)

Body Length: 20 to 24 mm.

Wing Span: 24 to 26 mm.

Male: Head black except apical half of labrum, anteclypeus, lower face below base of antennae and small postocular spots which are pale. Dorsum of prothorax black, sides light. Dorsum of thorax entirely black, no pale antehumeral stripe, sides pale greenish except posterior spot on second lateral suture and third lateral suture

a hairline with a wide posterior spot. Legs with femora black on outer margin and pale on inner, tibia light with lateral dark stripe, tarsi pale. Abdominal segments as follows: one pale with dorsum black except apical ring, two to seven pale with dorsum black except incomplete pale basal ring, eight and nine black with blue spot at apex, ten black on dorsum. Superior anal appendage strongly decurved, inferiors short and concave.

Characteristics of the female are from Needham and Heywood (1929).

Female: Similar to male: Thorax blue with wide middorsal black stripe and pale antehumeral stripe, humeral stripe and basal spots of second and third lateral sutures very narrow. Abdomen with dorsum entirely black or as in male. The female of this species passes through several color changes.

Ischnura kellicotti Williamson

Characteristics of this species are from Needham and Heywood (1929)

Male: Head blue below, labrum blue with basal black line, anteclypeus blue, postclypeus black. Lower parts of face blue to base of antennae which are black, remainder of head black with pale post-ocular spots which are not connected. Dorsum of prothorax black with a triangular pale line anteriorly, pale lateral middorsal spots, pale lower sides and posterior margin. Thorax blue with wide black middorsal stripe, black humeral stripe, black narrow interrupted line on basal half of second lateral suture and narrow black stripe on third lateral suture; pale antehumeral stripe equal width throughout.

Abdomen with dorsum bronze-black, blue as follows: one with wide apical ring, two with large basal spot and a wide apical ring, three to seven with pale narrow interrupted basal rings, seven with apical ring, eight with narrow basal ring, nine entirely blue, ten with blue narrowed on either side near middle, also two small round basal spots, apex with elevated process that is scarcely bifid. Sides of one and two blue and black, three to seven and ten brownish or yellowish, eight and nine black bordered with blue.

Female: Homoeochromatic form - Similar to male. Postocular spots large and prolonged to meet the pale color of the rear of the head. Abdomen with the blue on one and two more extensive, eight and nine with pale color more variable but usually more extensive.

Female: Heterochromatic form - Like the homoeochromatic form but with orange color replacing the blue-green.

County Records: LeFlore, Pushmataha

Ischnura posita (Hagen) (Figs. 1B, 2, 3G, 7D)

Body Length: 25 to 30 mm.

Wing Span: 24 to 27 mm.

Male: Labrum, anteclypeus and anterior one-fourth of head light brown, basal fourth of labrum, postclypeus and posterior three-fourths of head black except for anterior margin. Thorax black above the humeral suture except the antehumeral pale stripe which is often in the shape of an inverted exclamation mark; remainder of thorax light

with thin black line along the second lateral suture. Dorsum of abdomen black except thin yellow basal band on segments three to six, ventral surface yellow; abdominal segment ten with a short posteriorly directed dorsoapical process; anal appendages equal in length, the superiors flattened on mesal surface.

Female: Markings the same as male, color yellowish rather than blue. Abdominal segments three to six with basal band less conspicuous, ovipositor extending to apex of abdomen, stylets not contiguous.

County Records: Alfalfa, Caddo, Canadian, Carter, Cleveland, Comanche, Hughes, Johnston, Latimer, LeFlore, McClain, McCurtain, Marshall, Mays, Murray, Oklahoma, Okmulgee, Pawnee, Payne, Pittsburg, Pontotoc, Pushmataha, Sequoyah, Woodward.

Ischnura ramburi (Selys) (Figs. 7E, 9I)

Body Length: 33 to 38 mm.

Wing Span: 35 to 40 mm.

Male: Labrum greenish with basal black band, anteclypeus, lower front of head and postocular spots green, postclypeus and back of head black. Dorsal half of thorax black with thin green antehumeral stripe, ventral half green with short dark stripe along lateral suture. Stigma of fore and hind wings differ in color in male, similar in females. Legs green on inner or anterior surface black on outer or posterior surface. Abdominal segments as follows: one to seven black on dorsum, yellow on ventral half; eight entirely blue; nine and ten black dorsally. Superior anal appendages shorter than the inferiors.

Female: Color and markings same as in male. Ventral apical spine present on segment eight. Ovipositor not extending beyond apex of abdomen, stylets short and close together.

County Records: Carter, Marshall, Muskogee.

Ischnura verticalis (Say) (Fig. 7F)

Body Length: 26 to 30 mm.

Wing Span: 30 to 40 mm.

Male: Head black on posterior half, postclypeus black, labrum, anteclypeus and front of head green; green postocular spots present. Prothorax black on dorsum, sides and venter green; dorsum of thorax black except for antehumeral green stripe which is about one-third the width of middorsal black stripe; the mesepimerion black except for green stripe near margin of metepisternum which is green as well as metepimerion; legs black on outer surface with inner surface green black spines present; wings with stigma different in color. Abdomen with dorsum of segments one to seven blue-black, the ventral surface greenish yellow, dorsum and apical half of segments eight and nine grayish-blue with black on basal half of sides, segment ten black on dorsum with small dorsal apical projection, venter pale; superior anal appendage short and plate like, inferior anal appendages longer and curved medially.

Female: Head and thorax similar to male in color and markings. Abdomen black on dorsum and brown on ventral surface; ovipositor extending just slightly beyond apex of abdomen, valvae with ventral

margin finely serrated, stylets contiguous and curved slightly downward.

County Records: Alfalfa, Beaver, Caddo, Carter, Cleveland, Comanche, Cotton, Custer, Ellis, Garvin, Grant, Harmon, Harper, Johnston, Kay, Latimer, LeFlore, Love, McClain, Marshall, Murray, Muskogee, Oklahoma, Pawnee, Payne, Pittsburg, Pontotoc, Wagoner, Washington, Washita, Woods, Woodward.

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APPENDIXES

Figure 1. Structural characters of Damselflies. A. Head of Enallagma civile Hagen; B. Prothorax and thorax of Ischnura posita (Hagen). Ab₁-first abdominal segment; Aclp-anteclypeus; AhSt-antehumeral stripe; Cx-coxa; E-eye; Epm₃-metepimerion; Eps₃-metepisternum; Fm-femur; HS-humeral suture; L-l labrum; LS₂-second lateral suture; LS₃-third lateral suture; MdC-middorsal carina; MdSt-middorsal stripe; Mies-mesinfraepisternum; Oc-ocelli; Pclp-postclypeus; Pos-postocular spot; Ptx-prothorax; Sp-leg spines, Tr-trochanter.

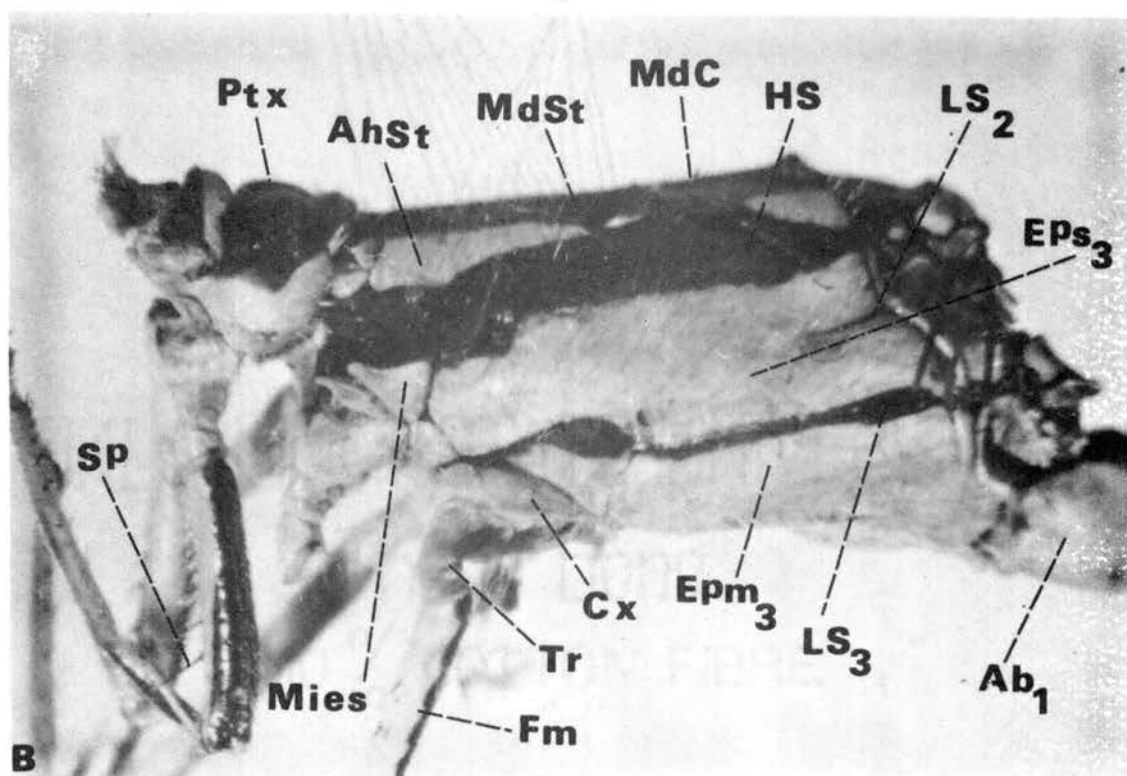
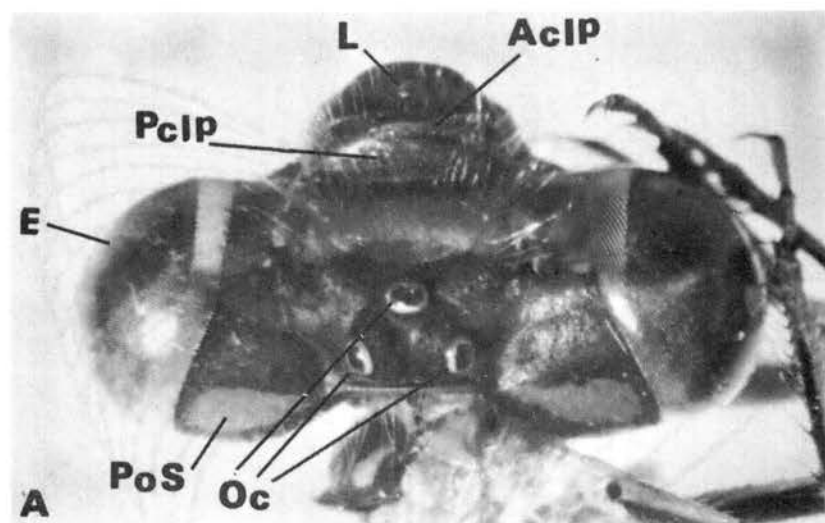


Figure 2. Wings of Ischnura posita (Hagen) (Coenagrionidae), showing venation of Zygoptera after Walker (1953). A-anal vein; A₁-branch of anal vein; Ac-anal crossvein; anx-antenodal crossveins; arch-arcus; C-costal vein; Cu-cubital vein; Cu₁, Cu₂-branches of cubital vein; M-median vein; M₁, M₂, M₃, M₄-branches of median vein; n-nodus; pnx-postnodal crossveins; pt-pterostigma; q-quadrangle, R-radial vein; Rs-radial sector; Sc-subcosta,

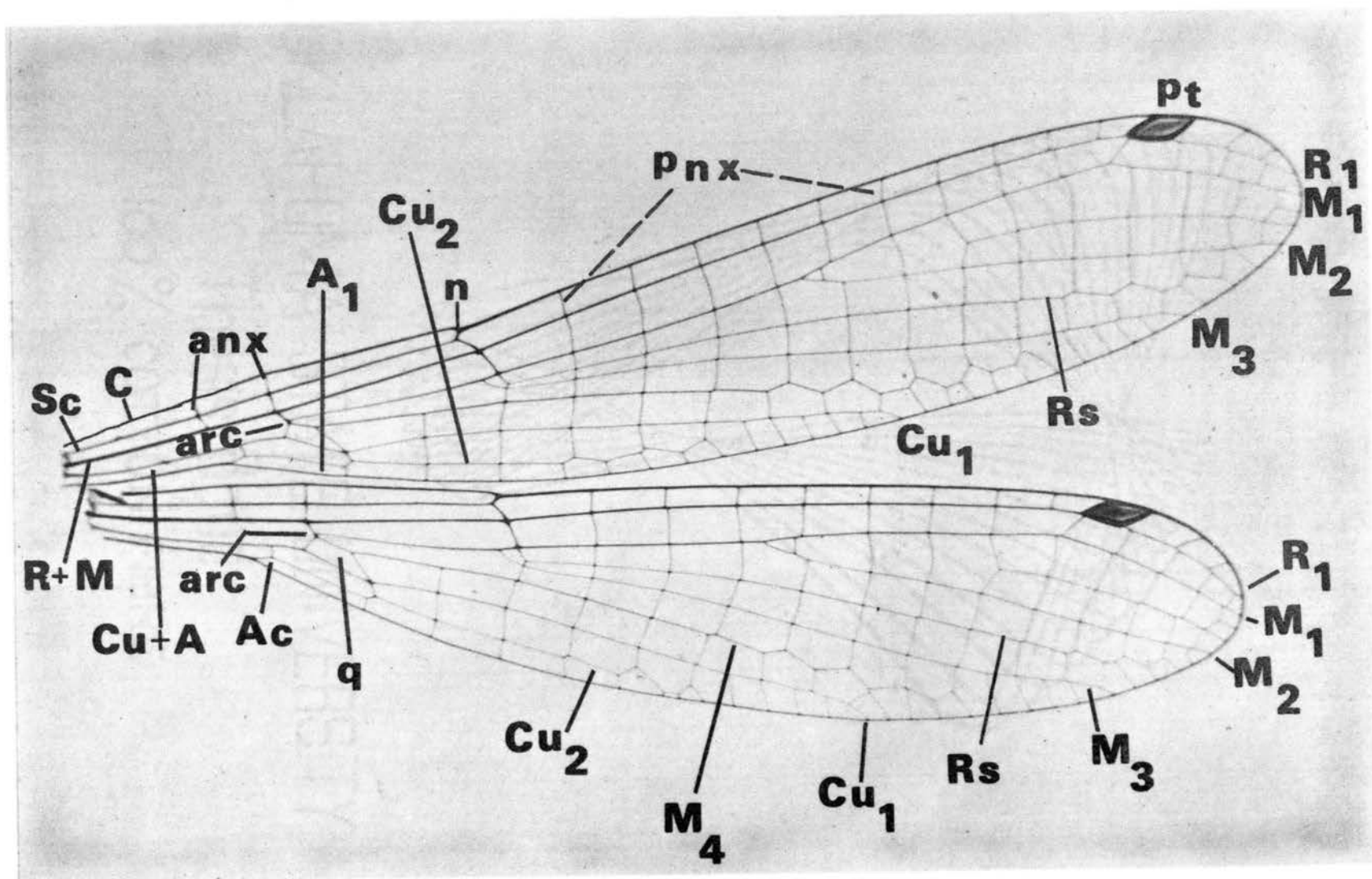


Figure 3. Wings of Zygoptera: A. Anomalagrion hastatum; B. Archilestes grandis; C. Enallagma civile; D. Calopteryx maculatum; E. Hetaerina americana; F. Hyponeura lugens; G. Ischnura posita.

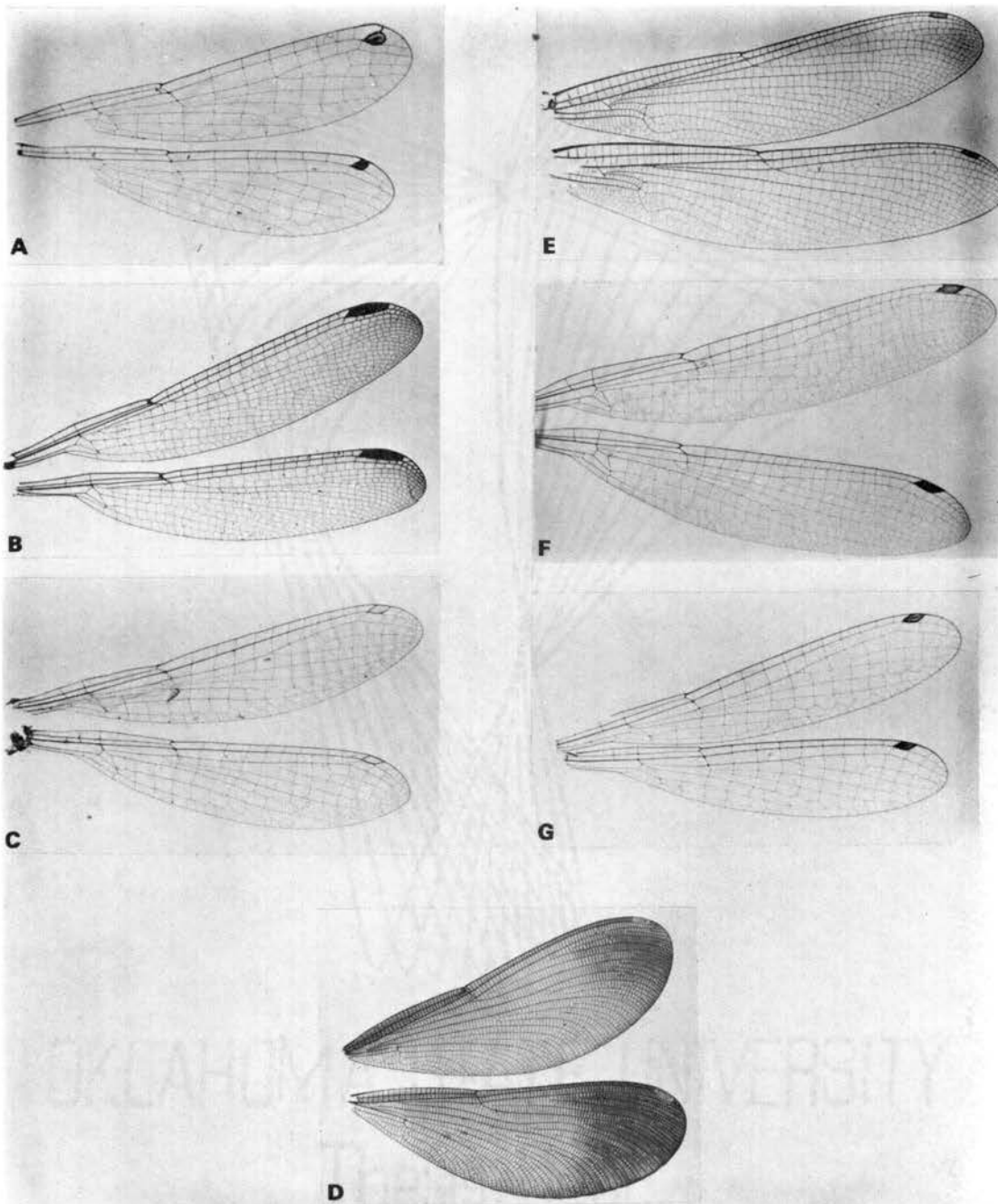


Figure 4. Anal appendages of male Zygoptera: A-D Calopterygidae:
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view; E-I Coenagrionidae: E. Anomalagrion hastatum;
F. Amphiagrion abbreviatum, lateral view; G. A.
abbreviatum, dorsal view; H. A. saucum, lateral view;
I. Argia alberta, lateral view.

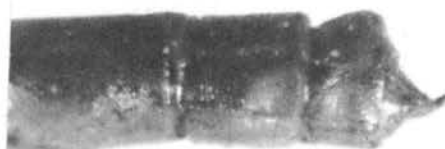
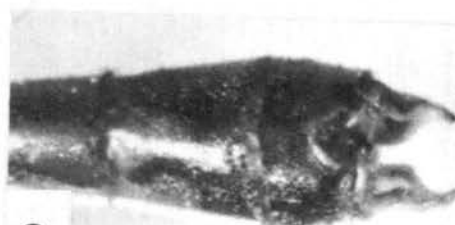
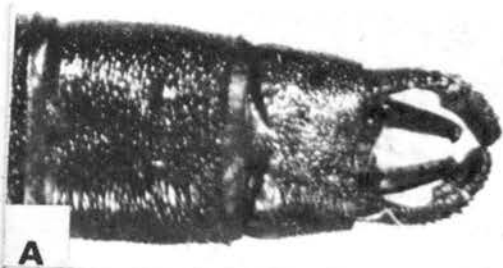


Figure 5. Anal appendages of male Zygoptera: A-K Coenagrionidae, all lateral views; A. Argia apicalis; B. A. agrioides; C. A. bipunctulata; D. A. immunda; E. A. moesta; F. A. sedula; G. A. tibialis; H. A. translata; I. A. violacea; J. A. vivida; K. Enallagma antennatum.

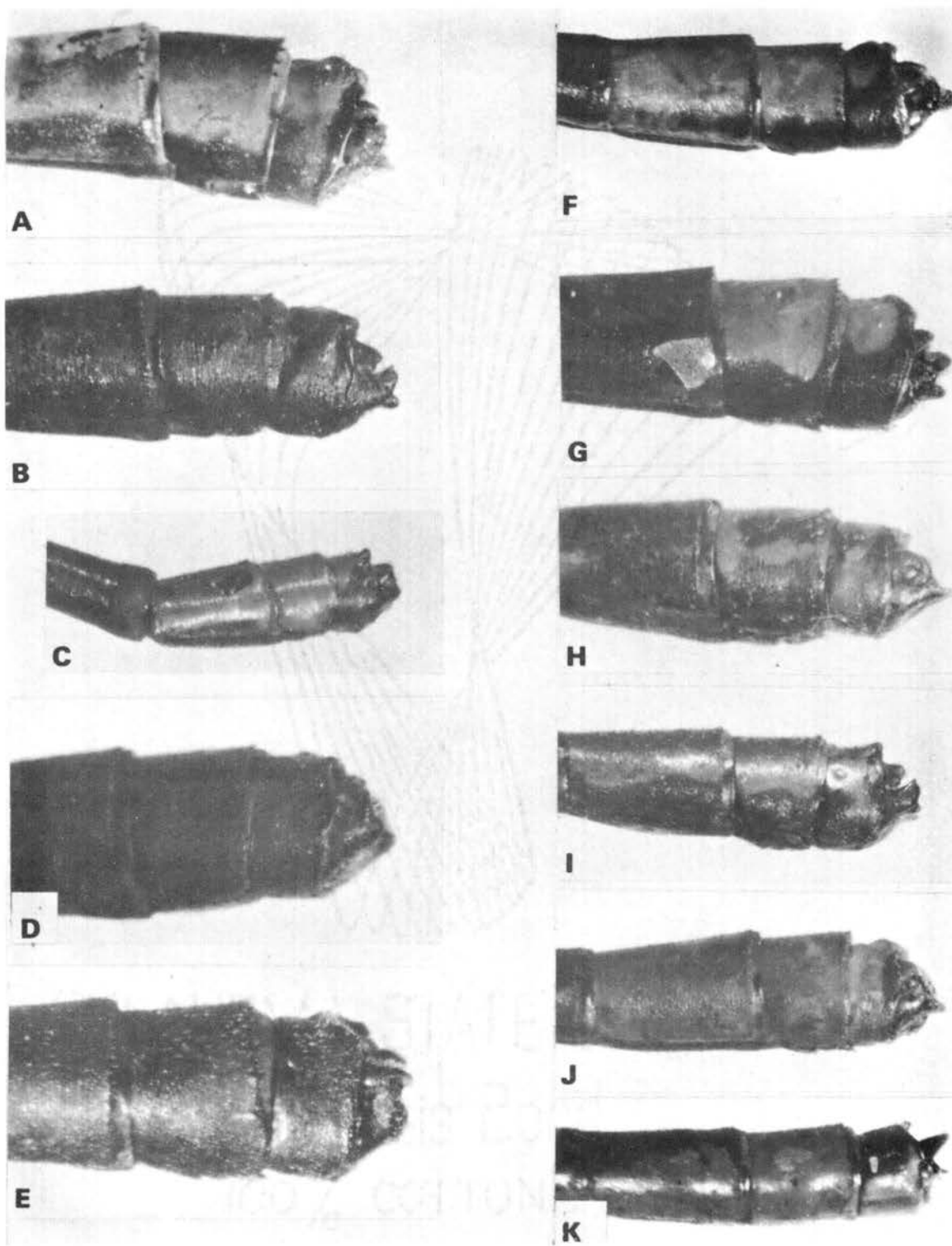


Figure 6. Anal appendages of male Zygoptera. A-K Coenagrionidae,
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I. E. signatum; J. E. traviatum; K. E. vesperum.

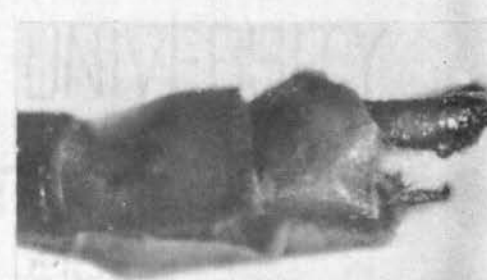
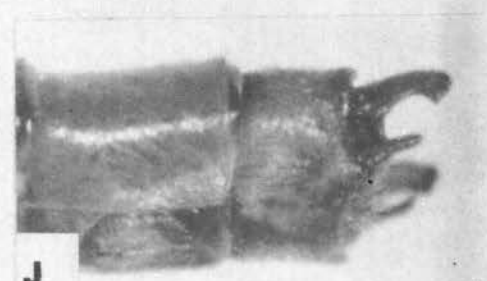
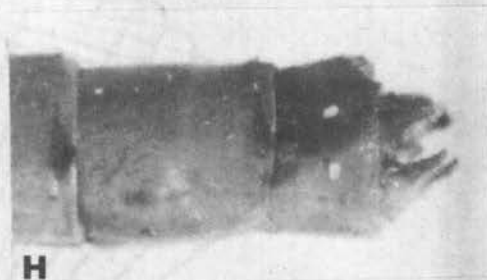
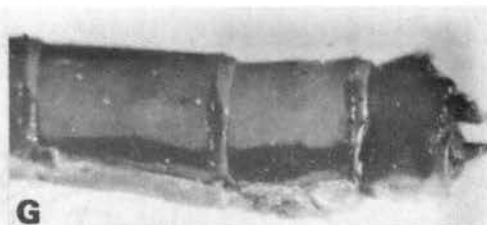
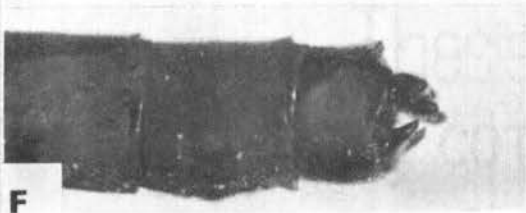
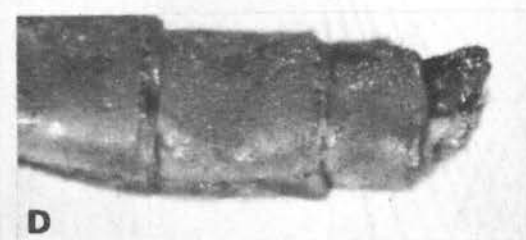


Figure 7. Anal appendages of male Zygoptera, lateral view unless stated. A-G coenagrionidae: A. Hyponeura lugens; B. Ischnura demorsa; C. I. demorsa, ventral view; D. I. posita; E. I. ramburi; F. I. verticalis; G. Telebais salva; H-J Lestidae: H. Archilestes grandis; I. Lestes alacer; J. L. disjunctus.

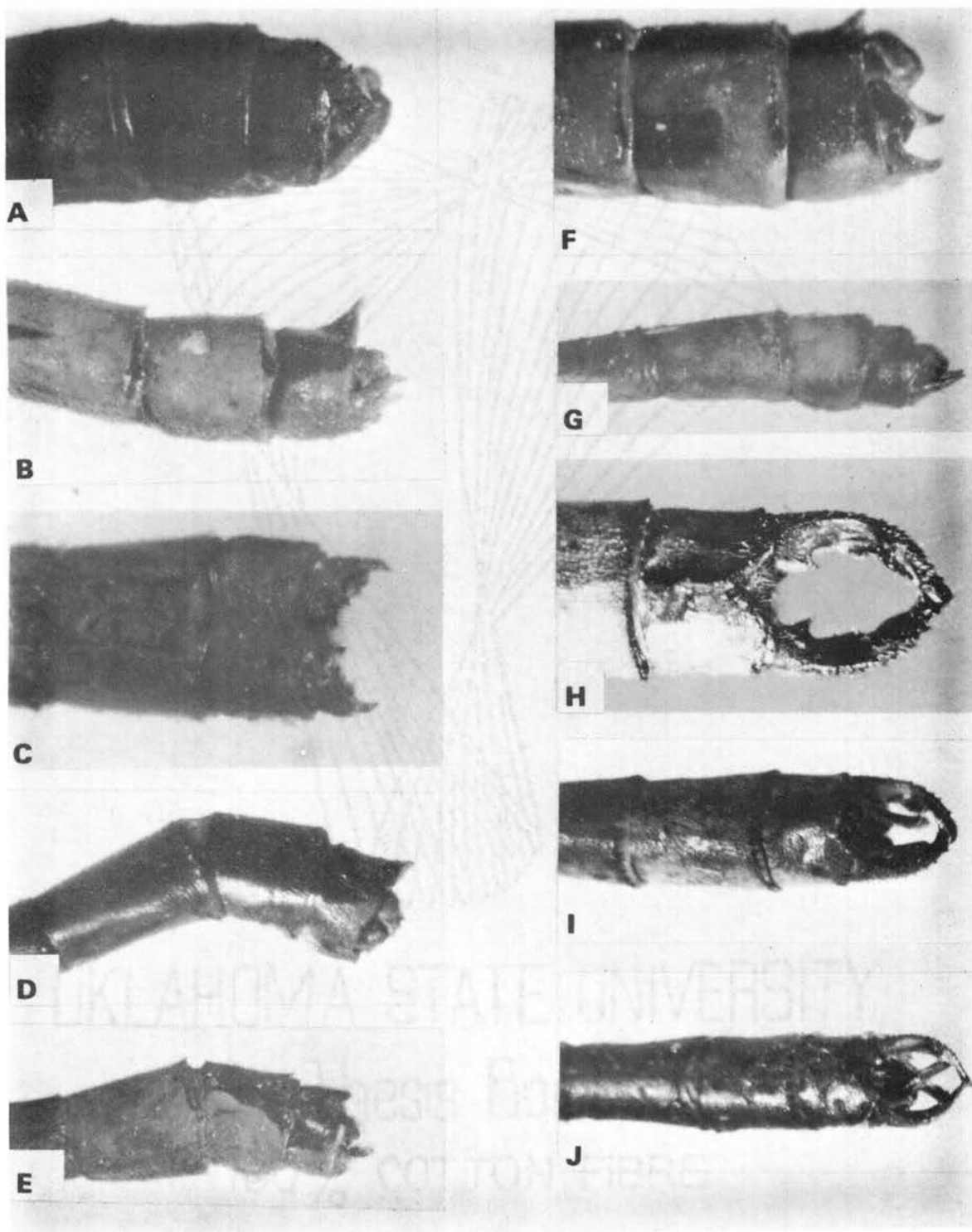


Figure 8. Anal appendages of male Zygoptera. A-H Lestidae: A. Lestes dryas, lateral view; B. L. dryas, dorsal view; C. L. forcipatus, dorsal view; D. L. rectangularis, lateral view; E. L. rectangularis, dorsal view; F. L. unguiculatus, dorsal view; G. L. vigilax, lateral view; H. L. vigilax, dorsal view.

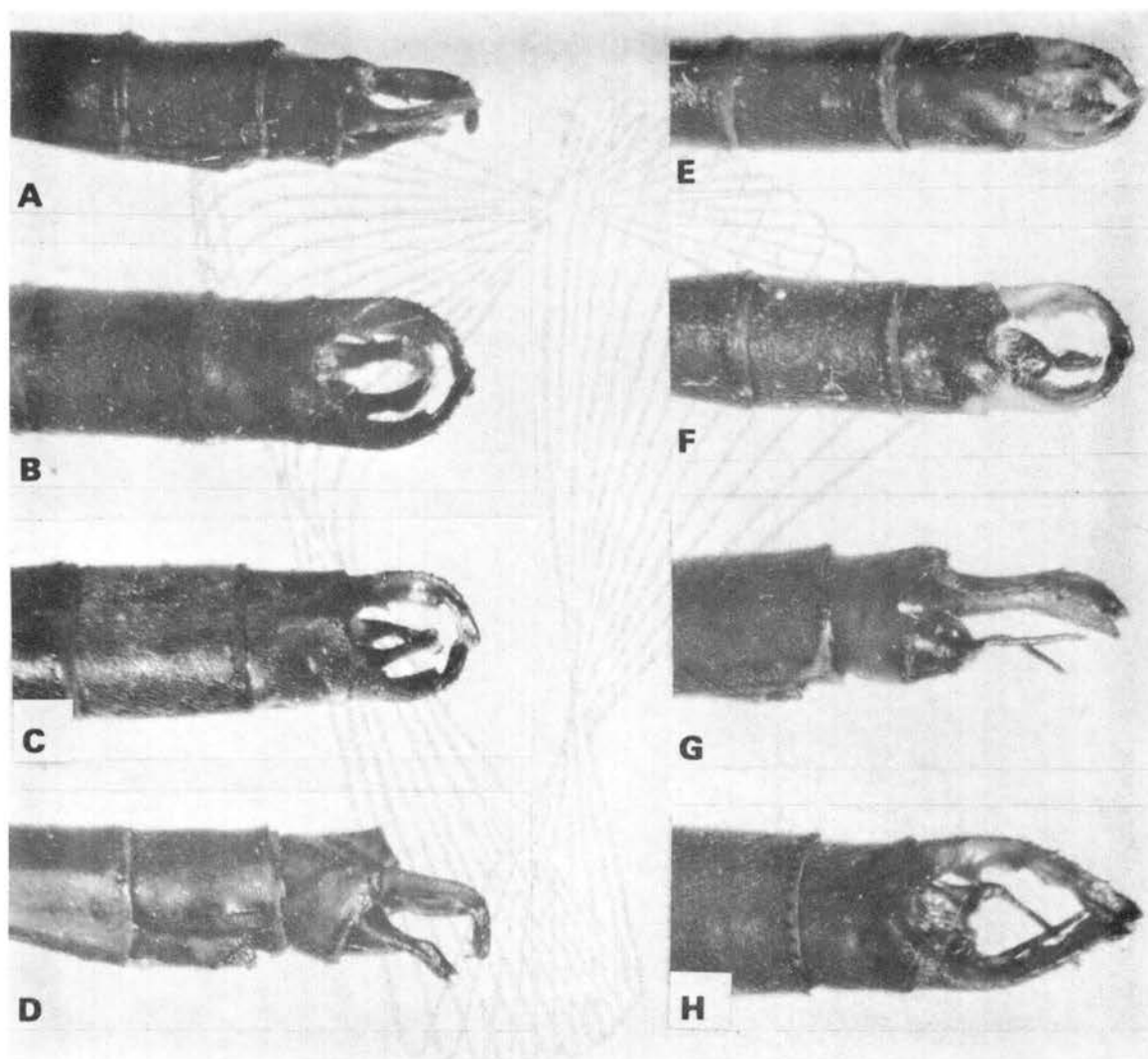
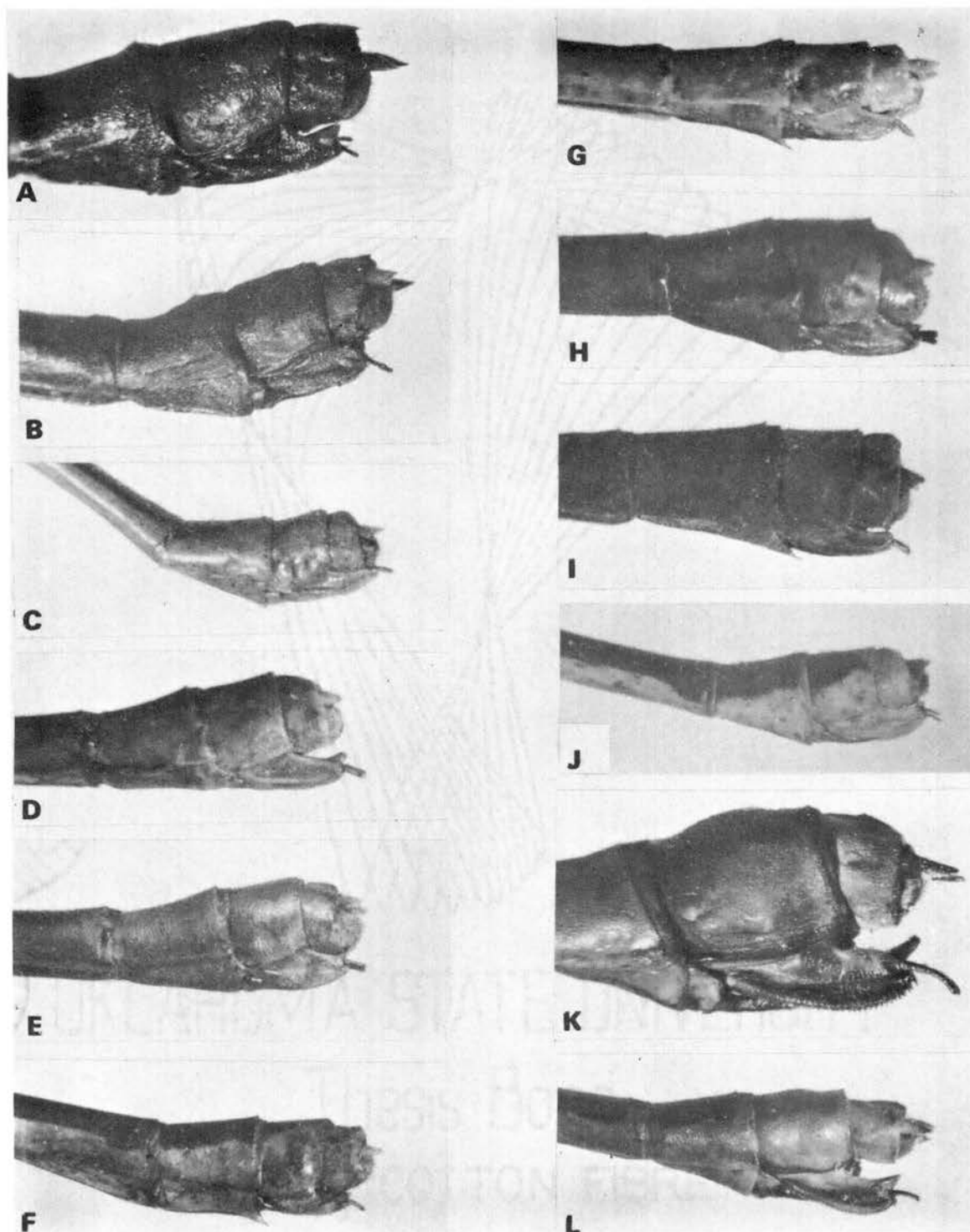


Figure 9. Terminal segments of female Zygoptera: A. Calopteryx maculatum; B. Hetaerina americana; C. Anomalagrion hastatum; D. Argia sedula; E. A. vivida; F. Enallagma exsulans; G. E. basiden; H. Hyponeura lugens; I. Ischnura ramburi; J. Nehelanna intergricollis; K. Archilestes grandis; L. Lestes rectangularis.



VITA

Donald Ray Molnar

Candidate for the Degree of

Master of Science

Thesis: THE DAMSELFLIES OF OKLAHOMA (ZYGOPTERA: ODONATA)

Major Field: Entomology

Biographical:

Personal Data: Born in Logan, West Virginia, 31 May 1946, the son of George and Margie Molnar.

Education: Graduated from Logan High School, Logan, West Virginia, 1964; attended Amarillo College, Amarillo, Texas, 1965-1966; received Bachelor of Science degree from West Texas State University, Canyon, Texas, with a major in Biology, May, 1968; completed the requirements for the Master of Science degree in July, 1973.

Experience: Teaching and laboratory assistant, West Texas State University, Canyon, Texas, 1967-1968; Preventive Medicine Specialist with the United States Army in Vietnam, 1969-1971; graduate teaching assistant, Oklahoma State University, Stillwater, Oklahoma, 1971-1973.