

Points of special interest

cap on egg

bivamous mandibles

gompheid-shaped labium

oviposition in tree

" - where ♂ watches ♀

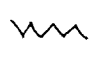
function of the branches of the mandibles

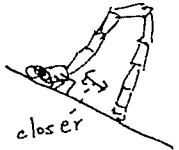
wing position while at rest

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illustrations

58231. *Palaemnema* oviposition

♀ on stem of plant 5' above water's edge - water slow with debris in it at edge of stream under overhanging plant where ♀ sat. Process watched about 10 minutes. ♀ inserted egg slowly - moved a tiny bit, then inserted another and another - moving each time - somewhat a zigzag pattern  - during period - moved up about 2" altogether.



tip of abdomen as close to body as possible  
slow deliberate movements of ovipositor.

♂ sat 5" from the ♀ (posterior to her) - apparently watching and waiting. When ~~AFE~~ <sup>observer</sup> moved to within 12" of insect the ♂ was disturbed. It flew to a perch 6" <sup>anterior</sup> above the insect ♀, waited, then moved back to its first position. The ♀ did not seem to be aware of observer - was not irritable.

Finally they were taken by fingers - papered together. part of plant + eggs preserved.

- Published records of *P.* in Mexico:
- S. L.P. - *P. domina*: paulitoyaca Calvert (1934) characters and the species of *Palaemnema* (Odonata: Agrionidae). Publ. of distri. record. Am. Ent. Soc., Tr. 57: 1-110.
  - (Morelos - *P. domina*) ms LKG
  - Puebla - *P. paulicaxa* Calvert (1931)
  - Ver. - *P. paulitoyaca* Calvert (1931)
  - P. paulicoba* Calvert (1931)
  - P. desidenata* Calvert (1931)
  - Calvert P.P. 1934. Two Mexican species of *Palaemnema* (Odonata: Agrionidae). Am. Ent. Soc., Tr. 59: 377-381.
  - \* probably Oaxaca - *P. domina* ~~selys~~ Calvert (1903)
  - Tabasco - *P. paulitaba* Calvert (1931)

\* ("Western side of Isthmus of Tehuantepec")

Were you wanting these records?   
 AMM  
 Feb 28, 1965

Alvarez del Toro's insect natural history museum, Tuxtla Gutierrez,  
30 July 1959. *P. desiderata* 1 ♂ coll. at El Chorradero 28 Aug 1952  
Our Location # 2

*Depanosticta*  
*Platyosticta*  
*Protosticta*  
*Cydonosticta*

Cowley 2 m. spp.  
Racenis in list  
Kennedy -

Did you  
want to  
include this?  
Feb 28, 1967

KNOWN TO RETRAFF  
# species recorded for Mexico - 287

# species in Mexico with larval descriptions in literature - 90

# of the above species that also occur north of Mexico - 77

# of genera of Odonata in Mexico - 73

# of " " " " " " with larval desc. in lit. - 49

" " " " the above + that also occur north of Mexico - 39

# larvae collected - 1600

# of individuals reared - 110

# " species reared - 36 (1963)

# " genera " - 22 (ALL TRIPS)

# " <sup>species</sup> undescribed larvae reared - 12 + 5 + 7 not reared

# " genera of " " " - 13

### REARED

Gomphoides - 1

Cannaphila - 1

Perithemis - 1

Micrathyria - 1

Dythemis - 2

Macrothemis - 3

Hetaerina - 1

Archilestes - 1

Heteragrion - 1

Argia - 3 (+ 1 or 2 undetermined)

Anisagrion - 1

Acanthagrion - 1

### NOT REARED

Erpetogomphus 1 but not reared

Epigomphus 1 " " "

Agriogomphus - 1 " " "

Amphipeteryx - 1 " " "

Archilestes - 1 " " "

Paraphlebia - 1 " " "

Heteragrion - 1 " " "

Archilestes

Cannaphila

Heteragrion

Anisagrion

~~Argia~~

Aeshna pusillus - 450 (8); 451 (12). Skins: 23

Aeshna sp -

Anax junius - 451 (1 ult, 6 tiny). Skins: 2 (Are these skins from 451?)

Anax sp. - 460 (1)

Anax n. sp. - 500 (8 sm., 6 med, 27 ± large). Skins:

Progomphus - 443 (4); 447 (32); 451 (2); 457 ( ), 467 (40); 470 (4); 474 (15);  
479 (50); 481 (1); 482 (4); 486 (6); 487 (3); 488 (10); 502 (8); 503 (2).

Aphylla or Phyllocyba - 447 (4); 474 (5); 479 (2); 486 (2); 487 (18); 488 (10);  
503 (2).

Archaeogomphus - 479 (27); 486 (3); 488 (12).

Agriogomphus - 432 (3); 443 (2) <sup>may differ from 482</sup>  
<sup>in height of d.h. on 8, 7, 6.</sup>  
502 (1); 503 (6); 508 (1)

Epiogomphus - 506 (39); 507 (3)

Libellulids: 443 (1); 447 (14); 449 (10); 451 (27); 474 (15); 476 (7); 479 (14);  
481 (1); 482 (30); 488 (13); 496 (16), 499 ( ); 500 (33); 502 (8);  
504 (1); 506 (1) + 37).

Orthemis [ferruginea]: 451 (1 exuviae)

Microthyria: 451 (12 ex); 500 (127), 508 (19)

Erythemis or Lepthemis: 451 (11); 500 (2)

Where are 451 Eryth. spinn.?

Cannacia herbida: 500 (1)

Dythemis: 473 (5) <sup>or Macrothemis</sup> see Libellulids - to be studied later

Brechmorhoga: 443 (1); 451 (5); 470 (7 + 1 ex); 473 (4); 479 (100 + ex)

Macrothemis:

Paltothemis: 451 (1); 457 ( ); 467 (1); 468 (1 ex); 470 (1); 479 (4).

Pantala:

Tramea: 449 (14); 450 (13); 451 (16 + 8 ex); 460 (6)

Hetaerina americana: 467 (6); 473 (1); 474 (2)

Hetaerina spp.: ~~447 (3)~~, 447 (5); 457 (2); 467 (5); 470 (2); 474 (4); 479 (1);  
443 (3); 446 (2); 451 (3)

482 (3); 502 (1); 511 (4)

Archilestes: 451 (2); 505 (8); 506 (5).

Lestes: 449 (2 ex); 451 (2 ex); 470 (2 ex); 500 (1 ex)

Paraphlebia: 506 (3)

Heteragrion: ~~443~~ (2); 470 (2); ~~478~~ 486 (2); 502 (1); 505 (5)

Zygoptera # - 447 (1); 508 (10)

Argia: 446 (1)

451 (3)

457 (3)

467 (14)

468 (1 ex)

470 (5)

473 (4)

476 (4)

478 (3)

479 (1)

486 (1)

487 (1)

496 (4)

499 (1)

chelata - 505 (38)

with 3 stripes - 505 (3)

chelata - 506 (19)

with 3 stripes - 506 (2)

3rd type - 506 (1)

4th type - 506 (1)

chelata - 508 (1)

511 (2)

Acanthagrion \_\_\_\_\_ 451 (1); 473 (1); 496 (1); 506 (1).

Enallagma - 451 (16); 500 (4)

Palaeonema - 443 (3); 470 (1); 502 (6).

Smith - EM of muscles  
of Odonata  
J. of Cellular Biology

Conceição machado  
Angelo B. M. Machado

dev. of pineal bodies

~~Nassa~~  
+ Distribution

sympathetic  
→ noradrenergic

Calcopteryx

3 ft up on leg

Gynacantha - on dry soil  
Septagrion - Sauter - attached  
to leaf of Bromeliad

found in egg  
in tandem

at least in most legs  
of the hind legs of  
Lindia

Stilpnidae

Calcopteryx  
ovipositor above H<sub>2</sub>O

w

Platy stictidae - ? Palaemon

Mocomyia  
Indian

Becton  
Sanger

India, Ceylon, Burma: (Sri Lanka)  
Malaysia: 4  
New Guinea: 12  
Ceylonosticta 7  
Drepanosticta 5-5-26

Gen. 505 ?  
Sps. 4500 4870

imm. w. of Imm. 8:  
1951, 1959

D.A. Yearbook 1952

119608 39770 Donn. 1967  
 94939 44666 Enal. westbachi  
 104868 99467 Heterogomphus elaboratum  
 9792 24857 (1969)  
 4805\*

P. viridis Westfall  
 34879 Westfall  
 Enacantha caribbeana  
 ~ Acanth. = Enall.

1966 all ✓

~~meg~~ G - ~~primigena~~  
 holgeri  
 dimidiata  
 W. - 1964 Cuba

Subclass Euthera  
 or Superorder  
 Order Cetacea

Order Cetacea

Platygenemis lawa + origami - Japan  
 New Entomol. 14(5); 37-41. 1965

Questions + notes -

L.C. of Archilestes - any other above ground  
 oviposition

Argiolepis } branched mandibles  
 Oxytrigma }  
 Huftmarch 1956 p 118  
 absence of labial setae } more primitive  
 branched mandibles } p 120  
 Rhinogomphus - higher than above

Megapodagrionidae

Amphylorini: Diptelbia Rimarella Pentaplebia

Megaloptera + Siphonoptera? - Chao 1947

Huftmarch 1953. Selysionura ovipos  
 p 62

Protonura }  
 Selysionura }  
 Lestel } some }  
 Siphonoptera }  
 p 64 - cleft + reduction v. setae - primitive



Papers

Archaeogonyphus larva + adult

Copa larva

Archilestes regalis larva 6 ♀  
hidalgo, n sp u + adult

Paraphlebia dimorphus  
larva new sp distributed

Heteragrion - larva

Daythemsis - sp n.

Pleurostyx sanguis -- ♀

Amphipteryx ♂ + ♀ new

Epigonyphus 3 spp n sp  
larva ?

Neanthagrion

Anax n sp or longipes  
gizzard ?

Leptobasis frosti check to see if it really is in  
this genus. Take vein by vein, char. by char.

Did we rear *Cannaphila*? See location  
coll. 63506 - check spm.

Argia chelata - reared -

G. maxwelli ♀

Virginia

Essex Co, Maine

2 papers for Entomology meeting

In his later handbook . . . p. 102, Fraser  
indicated (Fraser 1933) that the larva  
of *Prototicta montoni* Fraser was already  
"known" although it must have been known  
only to him since he published the  
description in 1943 ~~along with the~~ those  
~~of several other Odonata~~ which had  
been collected & figured "some years ago" -  
the exact date not given.

Sat -

From 1919 - look at  
~~1933~~ ~~pro et al~~  
1943

compare sizes of *Drepanosticta eumelana* Lef  
+ *suavia* *Protosticta gravelyi* Laid  
+ *mirago* *Protosticta montoni* F.

with sizes of our larvae + mirago -  
to determine the age of our larvae  
for possible changes in shape of head.

Leitch 1934. bicuspid mandibles  
only, (p 467) in *Euphaca*, *Cora*, or  
*Hemiphysalis* - considered archaic -

Does *P. gravelyi* have any sign of a process  
on lat. lobe of labium?

*P. montoni* has a small point.  
Palaeon. " " tiny teeth  
p 467 - L. 1934 - "no process"

Rec'd the "alleged to existence of  
Pal. material in Calvert 1931]

- 2 June 1962 1 ♂ body 10 mm w. ears 1 mm  
no gills
- 23 Jan 1963 1 ♀ - 13 mm w.c. 1 1/2 mm
- ~~3 Mar 1963~~ 2 sp? - 9 mm. w.c. 0 mm
- 9 Feb 1963 sent to Wattell
- 12 Feb 1963 1 ♂ - 15 mm w.c. 1 1/2 mm
- 3 Mar 1963 6 spms 13-15 mm w.c. ears 3/4 - 1/2 mm

*Palaeomonema*

*Palaeomonetes*

1♀ - 13 mm wing coxae 1 1/2 mm

sex? - 9 mm wing coxae 1 mm

G3470

♂ - 15 mm wing coxae 1 1/2 mm

G3502

? - ? mm " " 1 1/2 mm (dorsal view)

G3443

? sex - 7 mm w.c. 1.0

G3461 scut & w.c. full

G2429

♂ - body without w.c. = 1 mm gully = 10 mm

G3502 ✓

5 - ~~w.c. 3/4 mm~~ w.c. 3/4 - 1 1/2 mm

G3502  
443  
461

G3443

461  
470  
502

G3443  
w.c. width + body 1/2 = narrow width  
13 + 7 + 17 = 1 + 8 + 6

42  
11 1/4

-3 = 8.1/2  
+5 = 11

1.5 = 1  
13 X

15 11 — 13 1/2  
15

15/13.000  
135  
14650  
135

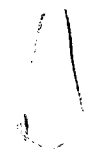
14 = X mm  
1.5 = 1  
1.5 | 14.00  
135  
50

10 = 3.5 mm HP  
10 = 10 mm HP

1 = 1.35 mm  
1 = 1.0 mm

HP - 5 mm body  
HP - 1 1/2 mm body  
(3 mm body)

Lagoon Bridge and Pond:



Coenagrionidae  
 Protoneuridae

- Coenagrionidae
- Protoneuridae
- Platycnemididae
- Platystictidae
- Lestidae
- Amphipterygidae
- Calopterygidae
- Polythoridae
- Diphlebiidae
- Megapodagrionidae
- Platycnemididae
- Epallidae
- Chlorocyphidae
- Synlestidae
- Pseudostigmatidae
- Hemiphlebiidae

Lestidae

Calopterygidae

setae on labium  
 setae on mentum  
 biramous mandible  
 types of gills (c/w)  
 cleft in labium  
 end of lateral lobe  
~~approximate~~ of labium  
 antennae  
 shape of mentum

venation  
 reduced  
 ↑  
 many veins

many genera  
 many species  
 ↑  
 fewer

position of wings  
 when at rest  
 egg laying habits

NO. 909-P RAG CONTENT PAPER GOLDSMITH BROS. N. Y. 8, CO 7-7800

- Platystictidae  
 Drepanosticta  
 Platysticta  
 Ceylanosticta  
 Protosticta  
 Palaemnema
- Protoneuridae (~~with Heterobrya~~)
- Platycnemididae
- Coenagrionidae
- Pseudostigmatidae see suborder
- Hemiphlebiidae
- Perilestidae
- Chlorolestidae Synlestidae (Lief 1934)
- Lestidae
- Megapodagrionidae Thaumatozona
- Pseudolestidae
- Amphipterygidae (Diptera) ~~see suborder~~
- Chlorocyphidae = Synlestidae
- Helochoritidae
- Polythoridae Cora
- Epallidae
- Agrionidae (Calopterygion) - ~~see suborder~~

L.K.G. Biramous mandible  
 11 genera of Agrion  
 sub Calopterygion Cora from spinn  
 Paraphlebia " "  
 Heteragrion " "

Bayadera  
 Hypalates from Jamaica  
 Thaumatozona Nd 1911 Euphaea } Lief 1934  
 Cora }  
 Heterina Hemiphlebia }  
 Rhinocypha }  
 Mnais }  
 Calopteryx Thaumatozona from photo in Calvert 1944 1915  
 3 of Coenagrionidae Bayadera - Nd. (Am LK6)  
 Hemiphlebia Molar lobe - Asahina 1954  
 Rimnella  
 Oxystigma  
 + 7 genera of Gomphidae  
 + Zygop (Tanypteryx) not needed  
 Mnais Davidius  
 Megapodagrion Rimnella Geijskes 1946  
 Oxystigma from L.K.G.  
 Heterina

Hypalates from Jamaica

II habitats of larvae

- Arroyo Frio - cold, volcanic,
- Chorreadero - not so cold, limestone, torrential
- S. Chiapas - , limestone, , many snails

III. description

- color - light with dark labial palps showing
- head - flat broad sides parallel
- mandibles - biramous

I historical

Palaeornis - genus - 1866 de Selys  
 = spp paulina - Honduras + Mex - (Drury specii)  
 de Selys 1866 angelina - Guatemala - (de Selys " ) } the latter 2 described for the first time  
 melanostigma - Venezuela - (Hagen)

de Selys 1866 - desiderata - from Mexico  
 1866 - 1866 - de Selys - as a race of m. paulina  
 - natalia from Panama  
 - clementia " Venezuela  
 + key to related genera

Kirby 1890 - genotype paulina designated

Calvert 1903 - dominica in Mex.  
 key et al

Meehan 1903 - photo venation

Williamson 1913 - discussed venation

1915 - showed ontogenetic color formation in wing hyp.  
 no noteworthy variation in ♂ eggs (of 2 ♂♂)

Schmidt 1915 - penes of Pal. & other = spp of

Kennedy 1917, 1920 Legion Protonera of Selys.

Rees 1918 - peruviana from Peru  
 melanota " Costa Rica } n. sp.  
 carmelita " Columbia }  
 + records from Mex + Central Am.  
 fig ♂ eggs + key to ♂♂ 7 spp - on color of thorax + abdomen

Mung 1919 - in wing venation key

Navas 1924 - apicalis from Columbia n. sp.

Archilestes - more quantities than Orolanta c. se Lich 1930

Davies of Innis 1957 - 4500 spp 500 genera

USDA yearbook 1952 - 4870 ?

from Calvert - 1931

I. Platystictidae

History of the family

Distribution

World - maps

Mexico - maps

Geographical

Seasonal

Phylogenetic relations

*Palaeemnema* - "pious memory of his forebears"

II. Biology

Characteristics of habitats

- of larvae

- of imagos

Time of emergence

Habits of imagos

III. Description of the larva

Color, shape, etc.

IV. Oviposition

de Selys 1860 - in "pious memory of his forebears"

genus *Palaeemnema* established

for 3 species

*paulina* Drury from Honduras and Mexico

*angelina* de Selys " Guatemala

*melonostigma* Hagen " Venezuela

Larva - history

Platystictidae

from ms - CHAFB

(Lieftinck 1934 - raised to family level)

Fraser 1919 -

*Protosticta gavelyi* = *exclusiva* - figural (Andes)

1933 -

no more uniformity in Platystictid larvae

*Platysticta*  
*Ceylonosticta*  
*Dippanosticta*  
*Protosticta* } the only Old World genera of Platystictidae

Lieftinck 1934

*Dippanosticta sindhana* Krüger - larva described - figural family made - Platystictidae

Fraser 1943

*Protosticta mortoni* Fraser