

DESCRIPTION OF THE LAST INSTAR LARVA OF *OLIGOCLADA LAETITIA* RIS, 1911 AND COMPARISON WITH OTHER LIBELLULIDAE (ANISOPTERA)

L.O. IRINEU DE SOUZA¹, J.M. COSTA² and L.A. ESPINDOLA¹

¹ Departamento de Biologia, Universidade Federal de Mato Grosso do Sul, MS, Brazil

² Departamento de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Quinta da Boa Vista, BR – 20.940-040, Rio de Janeiro, Brazil.
e-mail: jcosta@unisis.com.br

Received May 18, 2001 / Revised and Accepted March 5, 2002

The morphology of the specimens from Pantanal Sul–Mato–Grossense, Brazil is illustrated, described and compared with other genera of Libellulidae possessing dorsal hooks on abdominal segments VIII–X.

INTRODUCTION

Oligoclada Karsch, 1890, is a neotropical genus with 21 species (GARRISON, 2000). Until now *O. laetitia* has been known only from Minas Gerais, Rio de Janeiro, São Paulo and Rio Grande do Sul, Brazil (COSTA, 1970). Here, we document first records from the central region of Brazil and describe the larva.

METHODS AND TERMINOLOGY

Larvae were collected in a flooded area during the rainy season and reared to eclosion. Species determination was based on the teneral imago according to BORROR (1931) and COSTA (1970). Exuviae were stored in 75% ethyl alcohol and illustrated using a stereo microscope and camera lucida. Antennal segments, labial palps, mandibles and prementum are illustrated to a scale of 1 mm; head and posterior part of abdomen to a scale of 2 mm and lateral view of abdomen and ultimate larval instar to 5 mm. Mandibular formula is after WATSON (1956). All material is deposited in the Museu Nacional, Rio de Janeiro, Brazil.

DESCRIPTION

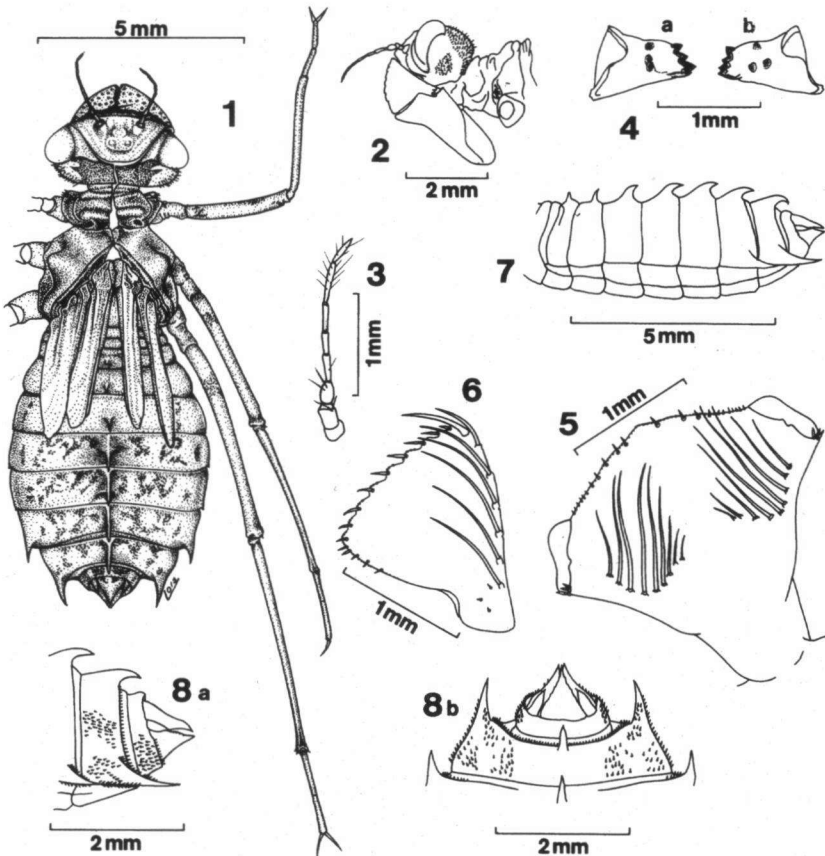
Figures 1-8

Material. – 2 ♂ and 2 ♀, Passo do Lontra, Corumbá, Mato Grosso do Sul, Brazil (19°24'37"S /

57°01'08"W), 1-VI-1996, L.O. Irineu de Souza leg.

Body typical of Libellulidae (Fig. 1), i.e., similar to larvae of the *Dythemis* (Trithemistinae) and *Perithemis* (Palpopleurinae). General colour light brown with small areas of dark brown (Fig. 1).

Head as wide as thorax. Postocular region with small spiniform setae (Figs 1-2). Occipital region with a large dark spot (Fig. 1); eyes small, semicircular in lateral view and oval in dorsal view; antennae 7 segmented (Fig. 3), the 6th the longest, 1st, 2nd and 4th equal in size, 3rd and 7th also subequal, each bearing small spiniform setae. Mandibles (Fig. 4) symmetrical with 4 incisor and 3 molar teeth; mandibular formula: L 1 2 3 4 y



Figs 1-8. *Oligoclada laetitia* Ris, structural features of the ultimate larval instar: (1) ultimate instar, general aspect; - (2) head, lateral view; - (3) antenna; - (4) mandibles: (a) left, (b) right; - (5) prementum, dorsal view; - (6) labial palp, dorsal view; - (7) abdomen, lateral view; - (8) abdomen, segments IX-X: (a) lateral view, (b) dorsal view.

Table I
Summary of dimensions (in mm) of *O. laetitia*

Characters	Male	Female
Total length	13.40	12.80
Length of head	1.70	1.60
Width of head	3.60	3.30
Length of eyes	1.15	1.10
Width of eyes	0.75	0.70
Total length of antennae	1.74	1.74
Length of antennomeres	0.18-0.18-0.30-0.18 0.24-0.36-0.30	0.18-0.18-0.30-0.18 0.26-0.34-0.30
Length of prementum	2.40	2.30
Basal width of prementum	0.60	0.60
Maximum width of prementum	2.30	2.20
Length of labial palps	1.60	1.60
Maximum width of labial palps	1.30	1.30
Length of forewing pads	4.30	4.20
Length of hindwing pads	4.10	4.10
Length of femora	F1:3.0-F2:4.4-F3:5.90	F1:3.0-F2:4.3-F3:5.6
Length of tibiae	T1:3.0-T2:3.7-T3:5.4	T1:3.0-T2:3.8-T3:5.3
Length of abdomen	8.0	7.3
Maximum width of abdomen	5.0	4.8
Length of lateral spine VIII	0.4	0.4
Basal width of lateral spine VIII	0.2	0.2
Length of lateral spine IX	0.7	0.75
Basal width of lateral spine IX	0.24	0.22
Length of epiproct	0.80	0.80
Basal width of epiproct	0.70	0.75
Length of paraproct	0.80	0.90
Basal width of paraproct	0.40	0.45
Length of cerci	0.50	0.40
Basal width of cerci	0.16	0.16

a b d / R 1 2 3 4 y a b d. Labium small, prementum and postmentum reaching procoxae; prementum (Fig. 5) with 9 premental setae of varying size on each side; distal margin with 11 spiniform setae on each side, the last very small; a group of 3 spiniform setae at each lateral margin at junction of labial palps. Labial palp (Fig. 6) with 6 setae; moveable hook large adjacent setae, reaching 3rd crenulation; distal margin of palp with 9 crenulations, each bearing one spiniform seta; internal margin with 5 spiniform setae.

T h o r a x (Figs 1-2) with supracoxal process bearing a small spiniform seta; wing pads, reaching proximal extremity of abdominal segment VI. Legs long; posterior pair longer than abdomen.

A b d o m e n (Figs 1, 7, 8) cylindrical, widest at segment VI. Middorsal hooks on segments III to IX decreasing in size from 3rd posteriorly, that on segment III small with distal end rounded, that on segment IV small with the distal end erect and inclined

posteriorly, that on segment VIII reaching anterior border of segment IX and that on segment IX reaching the posterior border of segment X. Lateral spines on segment VIII extending to half middorsal length of segment IX and that on segment IX reaching approximately distal end of paraprocts. Epiproct as long as paraprocts. Cerci cylindrical, with distal end curved medioventrally, reaching about 2/3 length of epiproct, cerci triangular in dorsal view. Paraprocts with small spines on base (Fig. 8). For dimensions see Table I.

HABITAT. – The specimens were collected while emerging in a flooded area linked at one branch of the Rio Miranda. There were many aquatic plants (*Salvinia* sp., *Eichhornia* sp., *Echinodorus* sp., *Nymphaea* sp., *Ludwigia* spp., *Ceratopteris* sp., *Azolla* sp. and *Pistia* sp. and submerged Gramineae. Depth at collection sites was 30-80 cm.

DISCUSSION

Of 21 species of *Oligoclada* only four of them, *O. haywardi*, *O. heliophila*, *O. monosticha* and *O. umbricola*, have not been recorded from Brazil. COSTA (1970) concluded that *O. pachystigma* is the nearest ally of *O. laetitia* and suspected that *O. laetitia* might be a subspecies of *O. pachystigma*. The presence of *O. laetitia* in Mato Grosso do Sul State confirms our belief that this species belongs to the central-south region of Brazil. More reared material from other sites and the discovery of new larvae of this genus will be necessary to determine if *O. laetitia* is a subspecies of *O. pachystigma*.

Oligoclada is included in the subfamily Brachydiplacinae (DAVIES & TOBIN, 1985) which includes 25 worldwide genera; nine of them occur in South America. The larva of the *O. laetitia* corroborates placement of this species within a group with dorsal

Table II

Comparison of the selected characters between the larvae of the genera which have dorsal hooks on abdominal segments III-IX and lateral spines on abdominal segments VIII-IX according to NEEDHAM et al. (2000) and IRINEU DE SOUZA et al. (1999)

Characters	<i>Dythemis</i>	<i>Macrothemis</i>	<i>Oligoclada</i>	<i>Perithemis</i>	<i>Planiplax</i>	<i>Tauriphila</i> (in part)
Total length of body (excluding antennae)			13.4	11 – 12	18.0	
Dorsal hooks	spine like	spine like	spine like	cultriform	spine like	spine like
Moveable hook of labial palp	obsolete	large	large	large	large	large
Abdomen	Twice as long as wide	twice as long as wide	twice as long as wide	twice as long as wide	twice as long as wide	slightly longer than wide
Premental setae			9	9-12	6-7	
Palpal setae	7-10	6-7	6	6	5	

hooks on abdominal segments III-IX and includes the genera *Dythemis* and *Macrothemis* (Trithemistinae), *Perithemis* (Palpopleurinae), *Planiplax* (Leuchorrhinae) and *Tauriphila* (Trameinae). Comparison of the main features of the 6 genera is in Table II.

ACKNOWLEDGEMENTS

This research was supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Universidade Federal de Mato Grosso do Sul (UFMS) and Universidade Federal do Rio de Janeiro (UFRJ).

REFERENCES

- BORROR, D.J., 1931. The genus *Oligoclada* (Odonata). *Misc. Publs Mus. Zool. Univ. Mich.* 22: 1-42, 7 pls excl.
- COSTA, J.M., 1970. Redescricao de *Oligoclada laetitia* Ris, 1911 (Libellulidae: Odonata). *Atas Soc. Biol. Rio de Janeiro* 13(5/6): 207-209.
- DAVIES, D.A.L. & P. TOBIN, 1985. *The dragonflies of the world: a systematic list of the extant Odonata*, Vol. 2. *Anisoptera*. Soc. Int. Odonatol., Utrecht.
- GARRISON, R.W., 2000. A synonymic list of the New World Odonata. <http://www.ups.edu/biology/museum/NewWorldOD.html>.
- IRINEU DE SOUZA, L.O., J.M. COSTA, & T.C. SANTOS, 1999. Description of the larva of *Planiplax phoenicura* Ris, from Pantanal Sul-Matogrossense, Brazil (Anisoptera: Libellulidae). *Odonatologica* 28(2): 159-163.
- NEEDHAM, J.G., M.J. WESTFALL & M.L. MAY, 2000. *Dragonflies of North America*. Scient. Publ., Gainesville/FL.
- WATSON, M.C., 1956. The utilization of mandibular armature in taxonomic studies of anisopterous nymphs. *Trans. Am. ent. Soc.* 81: 155-209.