Chrysopetalidae Ehlers, 1864 (Annelida: Polychaeta) from Venezuela

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Abstract. Chrysopetalidae Ehlers, 1864 are small worms characterized by the presence of gold colored flattened notochaetae covering the dorsal surface in many species. Twenty-two species in nine genera have been recorded from the tropical coasts of America, and eleven species are recognized in the Great Caribbean region. In Venezuela, up until now, only Bhawania goodei Webster,1884 has been recorded. The material examined was collected over several systematic surveys carried out in shallow waters (1 - 2 m deep) on rocky and algal substrata, at 15 locations along Venezuelan coasts. This study contributes to the increasing knowledge of this family in Venezuela.

Key words: polychaetous, Phyllodocida, diversity, Great Caribbean region, taxonomy

Resumen. Chrysopetalidae Ehlers, 1864 (Annelida: Polychaeta) de Venezuela. La familia Chrysopetalidae Ehlers, 1864 está constituida por un grupo de gusanos marinos que se caracterizan por presentar notosetas de forma aplanada y de color dorado que cubren el dorso. Veintidós especies, en nueve géneros han sido registradas para las costas tropicales de América, y once para la región del Gran Caribe. En Venezuela, hasta la presente revisión tan sólo Bhawania goodei Webster 1884 había sido registrada. El material examinado fue recolectado en aguas someras (1 - 2 m) sobre substrato rocoso y algas, en 15 estaciones a lo largo de las costas venezolanas. Este estudio contribuye a incrementar el conocimiento de esta familia en Venezuela.

Palabras clave: poliquetos, Phyllodocida, diversidad, Gran Caribe, taxonomía

Introduction

Chrysopetalidae are generally small worms (adults with length of 1mm, others may reach up to 50 mm); they may have less than 20 segments (Dysponetus Levinsen 1879) or over than 300 (Bhawanina Schmarda 1861), and are characterized by the presence of flattened, gold colored notochaetae covering the dorsal surface in species the most genera. Rouse & Pleijel (2001) divided the family into two groups considering the arrangement and morphology of the notochaetae. Chrysopetalids live mainly in coastal zones and are associated with rocky habitats, reefs and sandy bottoms. Thrausmatos Watson 2001 species, however, has been reported in hydrothermal vents and the cold seeps of the southwest Pacific (Papua, New Guinea) (Watson 2001), and Strepternos Watson Russell (in Bhaud & Cazaux, 1987) is recorded from abyssal zones (Watson-Russell In: Bhaud & Cazaux 1987). A partial review of the family was undertaken by Perkins (1985) who described two new genera, Hyalopale Perkins 1985 and Tretopale, and identified other species close to Florida. Other important studies include: Gathof (1984) who examined specimens from the Gulf of Mexico and reported a previously undescribed species (Paleaequor sp.); San Martín (1986) who erected a new genus and species, Acanthopale perkinsi, from Cuba; Watson-Russell (1986) who made available contribution in erecting the new genus Paleaequor to include the two species described previously as Paleaequor heteroseta (Hartman 1945) and Bhawania brevis (Gallardo 1968), and also Watson-Russell (in Bhaud & Cazaux 1987) provided
identification keys for larvae and juvenile worms. This review led to the description of *Strepternos didymopyton* who also put forward a new genus *Arichlidon* (Watson-Russell 1998) to include *Bhawania reyssi* (Katzmann, Laubier & Ramos 1974). A total of 42 nominal species in 12 genera are recognized in the Chrysopetalidae (Rouse & Pleijel 2001, Watson-Russell 2000) and of these, 22 species in nine genera have been recorded from the tropical coasts of America. Mora-Vallín (2009) enlisted the presence of 14 species in the Great Caribbean region, but warned that three of these might be the same as one of the other species collected or undescribed species. In this paper we characterize taxonomically three species of chrysopetalids from the Venezuelan coast, thereby increasing our knowledge of the diversity of polychaetes in this country.

**Materials and Methods**

The material examined was collected over several systematic surveys carried out in shallow waters (1 - 2 m deep) on rocky and algal substrata, at 15 locations (Fig. 1). Specimens were collected following the protocol described by Campos-Vásquez *et al.* (1999) and Fuentes (2011) and preserved in 70% ethanol. Semi-permanent microscope preparations of parapodia and chaetae were made in glycerin. Specimens were characterized according to the methodology described by Díaz & Liñero-Arana (2000) and the drawings were made following Coleman (2006). The examined and identified material is deposited in the Collection of Polychaeta at the Laboratorio de Biología de Poliquetos from Instituto Oceanográfico de Venezuela. A key to the species identified in this study is provided.

![Figure 1](Image 57x311 to 539x518)

**Figure 1.** Study area map showing the location of the stations surveyed (red stars).

**Results and Discussion**

A total of 119 specimens of Chrysopetalidae family were examined comprising three species belonging to three genus the species identified were *Bhawania goodei* Webster, 1884, from northeastern Venezuela, associated with coral substrate; *Chrysopetalum floridanum* Perkins, 1985 collected from the Paraguaná Peninsula, Los Roques Archipelago and La Tortuga Island, and *Acanthopale* cf. *perkinsi* San Martín, 1986 from La Tortuga Island associated with the algae *Halimeda* sp. *B. goodei* showed the highest abundance with 98 individuos, *C. floridanum* with 17 and *A. cf. perkinsi* three specimens.

**Key for species recorded from Venezuela**

1a.-Nuchal fold present; prostomium visible between paleae of anterior segments……………….. 2
1b.-Nuchald fold absent; prostomium completely hidden by paleae of anterior segments………

……………………………….. *Bhawania goodei* Webster 1884
2a (1a).- Palea slender not covering dorsal midline, pygidium with a bulb or anal cirrus ………


2b (1a).– Paleae flattened, covering the entire dorsum, including dorsal midline; pygidium with
two anal cirri, long or short........... Chrysopetalum
Ehlers 1864 ................., C. floridanum

Genus Bhawania Schmarda, 1861
Bhawania goodei Webster, 1884
Bhawania goodei Webster, 1884: 308-309, lam. 7f,
figs. 10-15; Day. 1967: 118-19, fig. 2.1a-f; Fauchald
1977: 10; Perkins 1985: 895-899, fig. 21a-g;
Ibarzabal 1986: 4; San Martin 1986: 18: Liñero-
Arana 1999: 55, fig. 2.

Material examined: Six specimens from the
Paraguana Peninsula (Falcón state); two from
Castillete (Zulia state); 12 from Bajo Cambuyo
(Nueva Esparta state), 16 from Turpialito (Gulf of
Cariaco), 33 from the Los Roques Archipelago; 25
from La Tortuga Island; four from La Bruja beach
(Gulf of Cariaco).

Remarks. Bhawania goodei seems to be the most
abundant and frequent species along the Venezuelan
coast and the specimens collected were associated
with a great variety of substrates: specimens from
Castillete (Zulia) and the Cape of San Román
(Falcón) were found on coral rock and in beds of
Thalassia testudinum, those from the eastern region
(Sucre and Nueva Esparta) were associated with
mangrove roots, bivalves, rocky substrates,
Millepora alcicornis and macroalgae, specimens
collected from La Tortuga Island were found with
Halimeda sp., and those from Los Roques were
mainly associated with coral rocks although Liñero-
Arana (1999) also recorded these last on the bivalve
Pernaviridis.

Distribution. Atlantic coast of America: Bermuda
Gulf of Mexico, from Florida to North Carolina
(Perkins 1985); Cuba Venezuela (Liñero-Arana
1999); south coast of the Iberian Peninsula and
probably the Atlantic and Indian coasts of Africa
and the Red Sea (San Martín 1986).

Genus Chrysopetalum Ehlers, 1864
Chrysopetalum floridanum Perkins, 1985

Figure 2A-J
Chrysopetalum floridanum Perkins, 1985: 886-890,
figs. 16-17, 18A-C. Mora-Vallín 2009: 127.

Material examined. Eighteen specimens. LBPH-
Ch0021 (13) specimens, Paraguana Peninsula found
on coral rock, LBPH-Ch0021 (5) specimens, La
Tortuga Island, associated with Halimeda sp.

Characterization. Largest complete specimen 10 mm
long, 1 mm wide and with 42 chaetigers.

Prostomium with two pairs of eyes on both the
anterior and the posterior end; median antenna short
and distally blunt, located dorsally behind the first
pair of eyes (Fig. 2A); lateral antennae on anterior
end; caruncle partially covering the posterior end of
the prostomium; palps originating ventrally near the
anterior margin of the prostomium. Parapods 1 and 2,
uniramous. Parapodia biramous from the third
chaetiger (Fig. 2B). Notochaetae consisting of
paleae and spines (Fig. 2C-F). Tips of paleae entire
with dorsal surface knobbled; middle paleae from
middle segments with obtuse tips and 9-10 internal
rims; lateral paleae decreasing to spine anteromedially.

Neurochaetae falcigers with moderately long blade, inner margin serrate,
serration extending near to falcate tip, upper few
distinctly longer than middle and lower ones (Figs.
2G-I). Pygidium with two long anal cirri (Fig. 2J).

Variation. Two specimens complete; 6-7 mm long, 1
mm wide and with 36-39 segments; three specimens
with one pair of eyes and five without them. One
specimen without biserrate paleae in midline palea

Remarks. Six chrysopetalid species have been
recorded for the Great Caribbean, but C. occidentale
Johnson 1897 is considered questionable to region,
because that is type locality is California, but is very
close to C. floridanum, the difference between these
is that in the former, the inner serration on the
falciger blade does not extend to near the falcate
tips, the median antenna is directed anteriorly and
the anterior eyes are oval. Perkins indicated that the
arrangement of the anterior notochaetae on the
middle segments is the same for both species, but
various forms of these chaetae are more often absent
in C. floridanum. For the other species recorded for
the area, C. floridanum differs C. heteropalea
Perkins 1985 because the latter has transverse ridges
paleas; differs from C. elegans Bush, in Verrill 1900
and C. eurypalea Perkins 1985 because the first has
glands between noto and neuropodia zone, while the
second has ciliated this zone, whereas C. floridanum
has neither glands nor cilia between noto and
neuropodia area but if has glands in neuropodia.

Finally C. floridanum differs C. hernancortezae
Perkins 1985, because this has tipped paleae
uncovered and glands on dorsal cirrhoporous.

Distribution. Florida (Perkins 1985), Great
Caribbean region (Mora-Vallín 2009) and
Venezuela.

Acanthopale cf. perkinsi San Martín, 1986

Figure 3 A-F
Acanthopale perkinsi San Martín, 1986:306-312,
figs. 6-11. Mora-Vallín 2009: 125
Material examined. Three specimens from La
Tortuga Island associated with coralline algae
(Halimeda sp.).
Characterization. All specimens incomplete, longest anterior fragment with 21 chaetigers. Body dorso-ventrally flattened. Pro stomium rounded, partially covered by the notochaetae of anterior cha etigers. Two pairs of eyes. Median antenna short, emerging in front of the eyes (Fig. 3A). Two lateral antennae, twice as long as the median antenna but shorter than the tentacular cirri. Caruncle oval, posterior to prostomium. First segment achaetous, reduced dorsally, with a pair of dorsal and ventral cirri. Second and third segments biramous, each with noto-neurochaetae and dorsal and ventral cirri. Notopodia with long and slender dorsal cirri, slightly bulbous basally; long, oval cirrophores; ventral cirri shorter than dorsal ones, and three groups of notochaetae (anterior, lateral and posterior (Fig. 3B). All paleae very slender, two alternating series of triangular curved spines arranged in two perpendicular planes (Fig. 3C-E). In anterior group of paleae, closest to the middle of the body, spines
concave distally. Notochaetae in the anterior group, numbering 8-10 per group, thick and arranged in a broad row with tips curved towards the dorsal midline of the body; those in the lateral group, shorter and narrow, originating just in front of the anterior group above the notoaciculum and curving laterally. Notochaetae in the posterior group have two centers of origin; a median and lateral; those emerging from the median center are thin and very long; up to three times as long as the paleae of the anterior group; those emerging from the lateral center are similar, but shorter and thinner, oriented laterally. Neurochaetae with strongly heterogomph shaft; articles long and distally bidentate, with two hooked teeth, secondary tooth larger than terminal one (Fig. 3F). Posterior end not observed.

**Figura 3.** *Acanthopale* cf. *perkinsi*. A) anterior end, dorsal view; B) 20th parapodium, anterior view; C) inferior palea from 20th chaetiger; D) medial palea from the same chaetiger; E) superior palea from the same chaetiger; F) falciger neurochaetae.

Remarks. All specimens were broken, partially damaged, anterior fragments with 17-21 chaetigers. The features of the prostomium and the morphology and distribution of the chaetae on the anterior chaetigers agree well with the description of *A. perkinsi* given by San Martín (1986). However, we could not determine whether the morphology and distribution of the chaetae from the median and posterior body or the morphology the pygidium are similar to that of this species. San Martín indicated that the *Acanthopale* genus differs from *Bhawania* Schmarda, 1861, *Paleanotus* Schmarda, 1861, *Hyalopale* Perkins, 1985 and *Treptopale* Perkins, 1985 in the shape and distribution of the paleae and in the arrangement of chaetae and cirri on the anterior three segments. *Acanthopale* is, however, similar to *Chrysopetalum* Ehlers, 1864 as regards the shape of the structures of the anterior region, although there are differences in the origin of the median antenna which is front of the eyes in *Acanthopale* but behind the anterior pair of eyes in *Chrysopetalum* as well as differences in the distribution and origin of the paleae. Further analyses may be consulted in San Martín (1986). We need to examine and characterize complete, best preserved specimens in order to determine whether *A. perkinsi* is actually present in Venezuela, for now, the specimens from La Tortuga Island have been identified as *A* cf. *perkinsi*.

Distribution. Venezuela

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