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## REVISION AND GLOBAL DISTRIBUTION OF *HESIONE SPLENDIDA* (ANNELIDA, POLYCHAETA, HESIONIDAE)

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**ABSTRACT** – The genus *Hesione* includes many nominal species throughout the world, of which the first described was the species *Hesione splendida*, from the Red Sea. Subsequently, during the last eighty years, some polychaetes researchers have been proposed many synonyms for this taxon. We revised all synonyms of *H. splendida* based on type material, Brazilian specimens and original descriptions. We confirmed the synonyms established for researchers and we are proposing that the species *H. ehlersi* **syn. n.** and *H. steenstrupii* **syn. n.** are synonyms of *H. splendida*. We are also providing the current global distribution for this hesionid polychaete. *H. splendida* groups several nominal species that exhibit few morphological and color polymorphisms. The main diagnostic characters are the color of dorsum (transversal narrow ivory colored lines, and median circular white-yellowish patches); absence of palps; two papilliform lateral antennae; and a tubercle on the middle-posterior region of proboscis. The species *H. splendida* inhabits hard and soft bottoms, in intertidal and infralittoral zones, in Africa, America, Asia and Europe.

**KEY WORDS:** BRAZIL; *HESIONE PICTA*; NEW SYNONYMS; RED SEA; WORLD OCCURRENCE.

### REVISÃO E DISTRIBUIÇÃO GLOBAL DE *HESIONE SPLENDIDA* (ANNELIDA, POLYCHAETA, HESIONIDAE)

**RESUMO** – O gênero *Hesione* inclui muitas espécies nominais em todo o mundo, da qual a primeira descrita foi a espécie *Hesione splendida*, para o Mar Vermelho. Posteriormente, durante os últimos oitenta anos, alguns pesquisadores em poliquetas propuseram muitos sinônimos para este táxon. Nós revisamos todos os sinônimos de *H. splendida* com base no material tipo, espécimes brasileiros e descrições originais. Nós confirmamos os sinônimos estabelecidos pelos pesquisadores e estamos propondo que as espécies *H. ehlersi* **syn. n.** e *H. steenstrupii* **syn. n.** são sinônimos de *H. splendida*. Também estamos fornecendo a distribuição global atual para este poliqueta hesionídeo. *H. splendida* agrupa várias espécies nominais que exibem alguns polimorfismos morfológicos e de cor. As principais características diagnósticas são a coloração do dorso (linhas transversais estreitas da cor de marfim, e manchas medianas circulares branco-amareladas); ausência de palpos; duas antenas laterais papiliformes; e um tubérculo na região médio-posterior da probóscide. A espécie *H. splendida* habita em substratos duros e moles, nas zonas entremarés e infralitoral, na África, América, Ásia e Europa.

**PALAVRAS-CHAVE:** BRASIL, *HESIONE PICTA*, NOVOS SINÔNIMOS; MAR VERMELHO; OCORRÊNCIA MUNDIAL.

### REVISIÓN Y DISTRIBUCIÓN GLOBAL DE *HESIONE SPLENDIDA* (ANNELIDA, POLYCHAETA, HESIONIDAE)

**RESUMEN** – El género *Hesione* incluye muchas especies nominales en todo el mundo, de los cuales el primero se describen la especie *Hesione splendida*, del Mar Rojo. Más tarde, durante los últimos ochenta años, algunos investigadores en poliquetos han propuesto muchos sinónimos para este taxón. Revisamos todos los sinónimos de *H. splendida* basa en el material tipo, especímenes brasileñas y descripciones originales. Confirmamos los sinónimos establecidos por los investigadores y estamos planteando que la especie *H. ehlersi* **syn. n.** y *H. steenstrupii* **syn. n.** son sinónimos de *H. splendida*. También estamos proporcionando la actual distribución mundial para este poliqueto hesionídeo. *H. splendida* agrupa varias especies nominales que exhiben algunos polimorfismos morfológicos y color. Las principales características diagnósticas son del color del dorso (líneas transversales estrechas de color marfil, y las manchas medianas circulares de color blanco-amarillentas); ausencia de palpos; dos antenas laterales papiliformes; y un tubérculo en la región medio-posterior de la probóscide. La especie *H. splendida* habita en sustratos duros y blandos, en las zonas intermareal y infralitoral, en África, América, Asia y Europa.

**PALABRAS CLAVE:** BRASIL; *HESIONE PICTA*; NUEVOS SINÓNIMOS; MAR ROJO; OCURRENCIA GLOBAL.

## INTRODUCTION

In “Histoire naturelle des animaux sans vertèbres”, Savigny in Lamarck (1818) erected the monotypic genus *Hesione*, for the species *Hesione splendida* from the Red Sea (Savigny in Lamarck

1818). The specimens of *H. splendida* were deposited in the Muséum National d'Histoire Naturelle (MNHN), France. Subsequently, many nominal species were described without diagnostic characteristics, causing great confusion in the systematics of this genus. The species *H. ceylonica* Grube, 1874 and *H. pacifica* McIntosh, 1885 were synonymized with *H. splendida* by Augener (1913) and Horst (1921), respectively (Augener 1913, Horst 1921). Later, Hartman (1938) synonymized the species *H. praetexta* Ehlers, 1887 with *H. picta* Müller in Grube, 1858; and, in 1951, Hartman reported *H. picta* for the Western Atlantic, including as its synonyms the species *H. proctochona* Schmarda, 1861, and *H. vittigera* Ehlers, 1887 (Hartman 1938, 1951). Day (1962) discussed the color pattern in several *Hesione* species, and synonymized *H. pantherina* Risso, 1826 with *H. splendida* from the Western Indian Ocean; and, in 1967, Day affirmed that the species *H. genetta* Grube, 1866 is also a junior synonym of *H. splendida* from Mozambique and Madagascar (Day 1962, 1967).

Nonato & Luna (1970) expanded the synonyms of *H. picta* to include the species *H. margaritae* Hansen, 1882. Finally, in 2008, Costa, De Assis & Christoffersen synonymized the species *H. picta* with *H. splendida*, based on *H. picta* specimens from Brazil (type locality of *H. picta*) and original descriptions and plates present in the specialized literature (Costa et al. 2008). Read (2015) in World Polychaeta Database shows all nominal species of *Hesione*. Here, we are synonymizing *H. ehlersi* Gravier, 1900 **syn. n.**, and *H. steenstrupii* Quatrefages, 1866 **syn. n.** with *H. splendida*, and we also confirm the synonymy of *H. picta* with *H. splendida*, based on the type material of *H. ehlersi*, *H. steenstrupii*, and *H. splendida* from the Muséum National d'Histoire Naturelle, and specimens of *Hesione* from Brazil. We then are able to indicate the current global distribution of *H. splendida*.

## MATERIALS AND METHODS

Specimens *Hesione* belonging to the type material from MNHN and Brazilian specimens were studied at the Laboratório de Invertebrados Paulo Young, Departamento de Sistemática e Ecologia, Centro de Ciências Exatas e da Natureza, Universidade Federal da Paraíba. The drawings were made under a stereoscopic microscope ZEISS with a camera lucida. The parapodial structures were observed with a composite optical microscope OLYMPUS BX41, and drawn under a camera lucida. The measurements were taken in millimeters. The plates and original descriptions of *Hesione* were analyzed on the basis of the available literature (in the personal libraries of Dr. Martin Lindsey Christoffersen, Departamento de Sistemática e Ecologia, Universidade Federal da Paraíba and Dr. Paulo da Cunha Lana, Laboratório de Bentos, Universidade Federal do Paraná).

## RESULTS

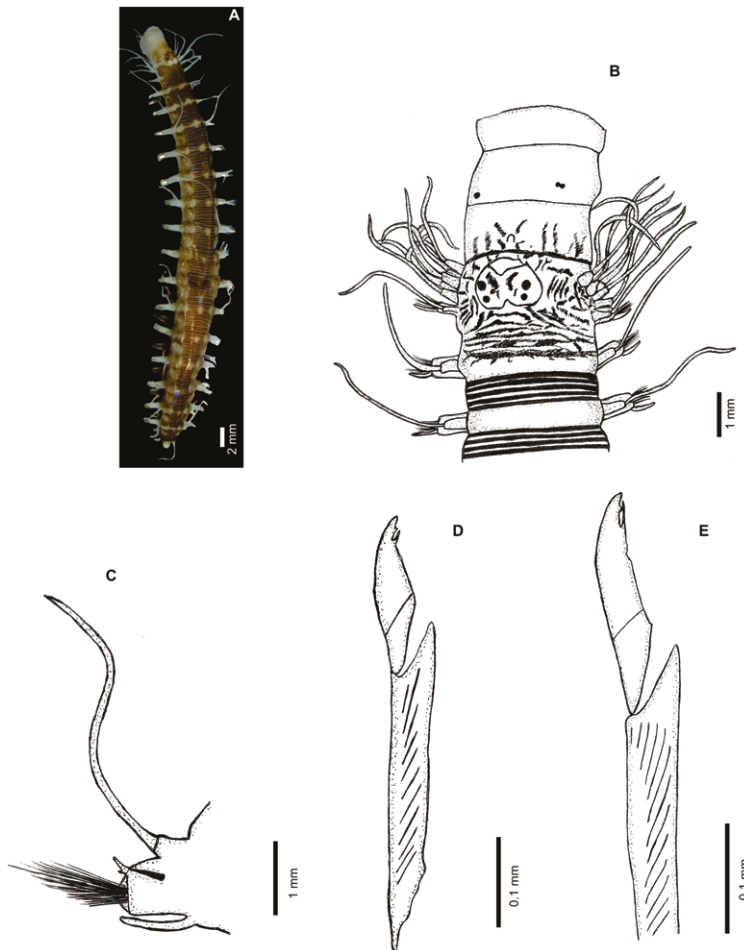
### Family Hesionidae

Genus *Hesione* Savigny in Lamarck, 1818

*Hesione splendida* Savigny in Lamarck, 1818 (Figure 1)

**Full synonyms.** *H. ceylonica*, *H. ehlersi* **syn. n.**, *H. genetta*, *H. margaritae*, *H. pacifica*, *H. pantherina*, *H. picta*, *H. praetexta*, *H. proctochona*, *H. steenstrupii* **syn. n.** and *H. vittigera*.

**Figure 1** - *Hesione splendida* Savigny in Lamarck, 1818. (A) complete body, dorsal view, (B) anterior region, dorsal view, (C) parapodium of the chaetiger 8, (D, E) falciger neurochaetae.



Savigny in Lamarck 1818: 316; Blainville 1828: 481–482; Grube 1850: 306; Müller in Grube 1858: 213–214, pl. 6, fig. 3; Schmarda 1861: 79–80, pl. 28, fig. 226; Quatrefages 1866: 95–99, pl. 9, fig. 17; Grube 1867: 65–66, 1874: 327; Hansen 1882: 6, pl. 1, figs 18–22; Ehlers 1887: 143–147, pl. 41, figures 1–6; Gravier 1900: 175–180, figs 42–45, pl. 9–10, figs 14–16; Augener 1913: 187–188, 1922: 21–22, figs 4–4A, 1926: 451–452, 1927: 131; Chamberlin 1919: 186–188, pl. 22, figs 7–8; Horst 1921: 80; Hessle 1925: 13–15; Fauvel 1923: 233–234, fig. 87, 1953: 104–105, figs 49A–G; Pruvot 1930: 27–29; Monro 1931: 10–12, figs 5–6, 1933: 25–26; Treadwell 1939: 217–218, figs 45A–B; Hartman 1951: 35, 1959: 185; Jones 1962: 180; Day 1962: 637, 1967: 228, figs 11.2A–C; Nonato & Luna 1970: 67–68, fig. 9; Perkins & Savage 1975: 28; Fauchald 1977: 16–17; Hartmann-Schröder 1979: 84, 1982: 8; Rullier & Amoureux 1979: 159; Campoy 1982: 208–210, pl. 11, figs A–D; Uebelacker 1984: 28–36 and 28–38, figs 28–33 and 28–34A–C; Sordino 1990: 35; San Martín & Gómez Esteban 1992: 104; Pleijel 1998: 107–

108, 158–159; Imajima 2003: 132–134, figs 78A–H; Parapar et al. 2004: 216–217, figs 76A–C; Costa et al. 2008: 131–133, figs 1A–E; Read 2015.

**Material examined.** *Hesione splendida*: holotype from Red Sea (MNHN type collection 139); 1 paratype from Red Sea (MNHN type collection 140); 87 specimens from Brazil, Atlantic Ocean (Ceará: Paracuru; Ponta do Trapiá, Camocim; Ponta do Mucuripe; Taíba; Rio Grande do Norte: Diogo Lopes, Macau; Ponta do Mel, Natal; Paraíba: Rio Paraíba do Norte (05°04'46,9" S; 36°26'19,5"W; 05°05'03,01" S; 36°27'18,9"W); Cabo Branco beach (7°09'16" S; 34°47'00" W), João Pessoa; Seixas beach, João Pessoa; Projeto Algas (6°29'–7°45'05" S; 24°54'–34°44'07" W); Cabedelo (6°59' S, 34°47' W–34°46' W; 7°01' S, 34°47' W); Bessa beach, João Pessoa (7°03' S, 34°47' W–34°43' W); Pernambuco: São José da Coroa Grande; Alagoas: Ponta Verde, Maceió; Sergipe (CIPY-POLY-UFPB 176–185, 226, 239, 313–315, 454, 838, 889, 891–895, 911–925, 958–959, 965–968, 1075–1080). *Hesione ehlersi*: 8 syntypes from Red Sea, Gulf of Aden, Djibouti (MNHN type material 287). *Hesione steenstrupii*: holotype from France, Atlantic Ocean, Pays Basque, Guettary (MNHN type material 479).

**Diagnosis.** Color of dorsum (transversal narrow ivory colored lines, and median circular white-yellowish patches). Absence of palps. Two papilliform lateral antennae. Tubercle on the middle-posterior region of proboscis (Figs. 1A, B).

**Description.** 16 chaetigers, 21 segments. Body short and robust. Color uniformly brown, with an intricate dorsal design of transversal narrow ivory colored lines, and median white-yellowish circular patches; cuticle with metallic lustre (Fig. 1A). Prostomium quadrangular. Facial tubercle present. Palps absent. Two, lateral papilliform antennae. Median antenna and median antennal furrows absent. Two pairs of reddish circular eyes, anterior pair is wider than posterior pair (Figs. 1A, B). Nuchal organs coalescing middorsally. Prostomium with distinct incision posteriorly. Two medium-lateral black spots and a tubercle in the medium-posterior region of the proboscis; terminal proboscis ring without papillae (Figs. 1A, B). Anterior modified dorsal cirri on segments 1–5, not distinctly annulated, cirrophores not fused (Fig. 1B). Notochaetae and notopodial lobes completely absent. Anterior modified ventral cirri on segments 1–4, not distinctly annulated (Fig. 1B). Neuropodia rectangular, truncated; dorsally situated papilliform projections present (Figs. 1B, C). Many parapodia exhibit brown spots on their front end, and black spots on their posterior region. Dark, distally pointed aciculae (Fig. 1C). Neurofalciger chaetae with neurochaetal shafts chambered; blades bidentate (Figs. 1D, E); prolonged teeth absent; spinigers absent. Pre-anal achaetiger segment with two dorsal and two ventral cirri (Fig. 1A). Pygidial cirri higher than dorsal cirri, not distinctly annulated. Pygidium cone-shaped (Fig. 1A).

**Habitat.** Hard and soft bottoms, intertidal and infralittoral zone.

**Distribution.** Red Sea, Mediterranean Sea, Greece, Italy, Atlantic coast of France to Senegal, Cape Verde Islands, Brazil, Caribbean Sea, Jamaica, Puerto Rico, Gulf of Mexico, Florida (USA), Pacific Ocean, Japan, tropical Indo-West Pacific, Samoa, Tonga, Sri Lanka (Savigny in Lamarck 1818, Müller in Grube 1858, Augener 1913, Treadwell 1939, Hartman 1951, Fauvel 1953,

Day 1967, Nonato and Luna 1970, Fauchald 1977, Uebelacker 1984, Pleijel 1998, Bellan 2001, Imajima 2003, Parapar et al. 2004, Castelli et al. 2008, Costa et al. 2008, Faulwetter 2010, Ramos 2010, Amaral et al. 2013, Read 2015).

## DISCUSSION

We confirm that the species *H. ceylonica*, *H. ehlersi* **syn. n.**, *H. genetta*, *H. margaritae*, *H. pacifica*, *H. pantherina*, *H. picta*, *H. praetexta*, *H. proctochona*, *H. steenstrupii* **syn. n.** and *H. vittigera* are synonyms of *H. splendida*, based on type material of *H. ehlersi*, *H. splendida* and *H. steenstrupii* from MNHN, and specimens collected in Brazil (type locality of *H. margaritae* and *H. picta*). The type material of *H. picta* is unknown. These current synonyms species exhibit few morphological and color polymorphisms. Therefore, all taxa refer to *H. splendida*. We also accept the synonyms published by previous researchers for polychaetes (e.g. Augener 1913, Horst 1921, Hartman 1938, 1951, Day 1962, 1967, Nonato & Luna 1970, Pleijel 1998, Costa et al. 2008, Read 2015).

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