

NEW RECORD OF *Hyachelia tortugae* BARNARD, 1967, AN AMPHIPOD EPIBIONT ON GREEN TURTLES *Chelonia mydas* (LINNAEUS, 1758) FROM GORGONA ISLAND (COLOMBIAN PACIFIC)*

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Abstract

Objectives: Characterize the amphipods collected in esophageal lavages of the green turtle *Chelonia mydas* (Linnaeus, 1758). **Scope:** Increase the characterization of diversity of a poorly known group, but of great importance in benthic environments, in Colombia. **Methodology:** Amphipods were collected from esophageal lavages carried out on 77 green turtles between February and December 2012 at Gorgona Island, Colombian Pacific. **Main results:** We report the occurrence of the amphipod *Hyachelia tortugae* Barnard, 1967, a species that lives exclusively as an epibiont of sea turtles, for the first time for the Colombian Pacific. Three *H. tortugae* individuals occurred in two of the analyzed turtles. The hyperiid amphipods *Paralycaea gracilis* Claus, 1879, *Schizoscelus ornatus* Claus, 1879, and *Parascelus* sp. were also collected in the esophageal contents of the turtles. **Conclusions:** This study highlights that systematic studies should be carried out to characterize the associated fauna in sea turtles in the Colombian Pacific.

Key words: *Hyachelia*, epibiont, *Chelonia mydas*, Gorgona Island, Colombia.

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NUEVO REGISTRO DE *Hyachelia tortugae* BARNARD, 1967, UN ANFÍPODO EPIBIONTE DE LA TORTUGA VERDE *Chelonia mydas* (LINNAEUS, 1758) EN ISLA GORGONA (PACÍFICO COLOMBIANO)

Resumen

Objetivos: Caracterizar los anfípodos recolectados en lavados esofágicos de la tortuga verde *Chelonia mydas* (Linnaeus, 1758). **Alcance:** Incremento de la caracterización de la diversidad de un grupo poco estudiado, pero de gran importancia en ambientes bentónicos, en Colombia. **Metodología:** Los anfípodos fueron recolectados a partir de lavados esofágicos realizados a 77 juveniles de tortuga verde entre febrero y diciembre 2012 en Isla Gorgona, Pacífico Colombiano. **Principales resultados:** Se reporta por primera vez para el Pacífico Colombiano el anfípodo *Hyachelia tortugae* Barnard, 1967, una especie que se encuentra exclusivamente como epibionte de tortugas marinas. Se registraron tres individuos en total de *H. tortugae* en dos de las tortugas analizadas. Adicionalmente, los anfípodos hipéridos *Paralycaea gracilis* Claus, 1879, *Schizoscelus ornatus* Claus, 1879 y *Parascelus* sp. fueron registrados en los contenidos esofágicos de las tortugas. **Conclusiones:** Este trabajo resalta la necesidad de implementar estudios sistemáticos que permitan caracterizar la fauna asociada a tortugas marinas en el Pacífico colombiano.

Palabras clave: *Hyachelia*, epibionte, *Chelonia mydas*, Isla Gorgona, Colombia.

INTRODUCCIÓN

Knowledge of gammarid amphipod diversity in Colombia and in particular in the Colombian Pacific is scarce. Gammarids of Gorgona Island (2° 58' 00" N and 78° 11' 24" W), a protected area in the Colombian Pacific belonging to the Eastern Tropical Pacific Marine Corridor, have been mainly identified to family level (CORTÉS *et al.*, 2012; VALENCIA *et al.*, 2014), and only a few studies have reached lower taxonomic levels (BARNARD, 1967a; VALENCIA *et al.*, 2014). We present a new record for the Colombian Pacific of the gammarid amphipod *Hyachelia tortugae* Barnard, 1967. The species was originally described for the Galapagos Islands and occurs exclusively as an epibiont of sea turtles (BARNARD, 1967b). *Hyachelia tortugae* has also been reported for the Hawaiian Islands (BALAZS *et al.*, 1987), Palmyra Atoll (YABUT *et al.*, 2014), and the Pacific coast of Costa Rica (ROBINSON *et al.*, 2016); in all cases, it was found only on green turtles. This amphipod inhabits the buccal cavity of green turtles where it seems to feed on food residues (BARNARD, 1967b), but it has also been recorded on the neck, skin, and skin lesions of turtles (AGUIRRE *et al.*, 1998).

The *H. tortugae* identified were collected as part of a study that aimed to characterize the intraspecific variation and diet of the green turtles of Gorgona Island (see SAMPSON *et al.*, 2017). Juveniles were manually captured at night over the reefs of La Azufrada and Playa Blanca, bimonthly from February to December 2012. Esophageal lavages were performed on each turtle and contents were preserved in 4% formaldehyde. Amphipods were sorted from the samples, identified, and deposited in the Marine Biology Collection at the Universidad del Valle, Cali, Colombia (CERBMcr-UV).

Of 77 lavaged green turtles, five contained amphipods, including *H. tortugae* and three species of hyperiids (Table 1). The *H. tortugae* were likely flushed out from the buccal cavity during the esophageal lavages carried out to analyze the diet of the turtles. Three *H. tortugae* individuals, one female (approx. 5 mm) and two males (approx. 6 mm) (Table 1), were found in two of the green turtles captured during February and March 2012 (Figure 1). The identified specimens fit the original description by BARNARD (1967b). *Hyachelia tortugae* is a sexually dimorphic amphipod that presents short antennae, with the first one being shorter than the second one. The gnathopods of the males are enlarged and subchelate: gnathopod 1 presents a propodus with an oblique palm and a dactylus that does not fit the palm (Figure 2A); gnathopod 2 presents a stout propodus, longer than broad, and an oblique palm that has spines and two protuberances (Figure 2B). In the pereopods, the propodus forms a subquelate palm and has four stout spines (Figure 2C). Uropods 1 and 2 present large rami, in which the outer ramus is setose, whereas the inner ramus lacks setae (Figure 2D). Uropod 3 has a short peduncle and the telson is cleft.

Table 1. Amphipods collected in esophageal lavages of green turtles (*Chelonia mydas*) from Gorgona Island, Colombian Pacific.

Family	Species	No. individuals	Specimens analyzed	Turtle SCL (cm)
Hyalidae	<i>Hyachelia tortugae</i> Barnard, 1967	1♀, 1♂	CAN-UV 1756	61.8
		1♂	CAN-UV 1755	55.2
Parascelidae	<i>Parascelus</i> sp. <i>Schizoscelus ornatus</i> Claus, 1879	1♀	CAN-UV 1757	56.8
		1♂	CAN-UV 1753	65.1
Pronoidae	<i>Paralycaea gracilis</i> Claus, 1879	1♀	CAN-UV 1752	47.1
		1♀	CAN-UV 1754	52.3

* SCL = straight carapace length

Only two species from the *Hyachelia* genus have been described: *H. tortugae* and *H. lowry* Serejo and Sittrop, 2009, the latter from Australia. The main characteristics used to distinguish these two species were described by SEREJO & SITTROP (2009) and

more recently by YABUT *et al.* (2014). A characteristic of *Hyachelia* is that it is the only genus in the family Hyalidae known to present an epibiont lifestyle and to have, as is usual in other epibiont amphipods, pereopods that have been modified as grasping appendages (BARNARD, 1967b) (Figure 1C). Although epibiosis, the settlement by organisms on living surfaces, is a common association in the marine realm due to the need of benthic organisms to find a substrate (WAHL, 2009), the association between amphipods and vertebrates is less common and little is known about the nature of the relationship (MOORE, 1995). In general, the substrate offered by the sea turtle carapace, skin tissue, and buccal cavity creates microenvironments that allow the presence of a great variety of fauna (FRICK & PFALLER, 2013). Due to sea turtles' characteristic long-range migrations, these types of associations may have important implications for the dispersion of marine invertebrates (FRICK & PFALLER, 2013).

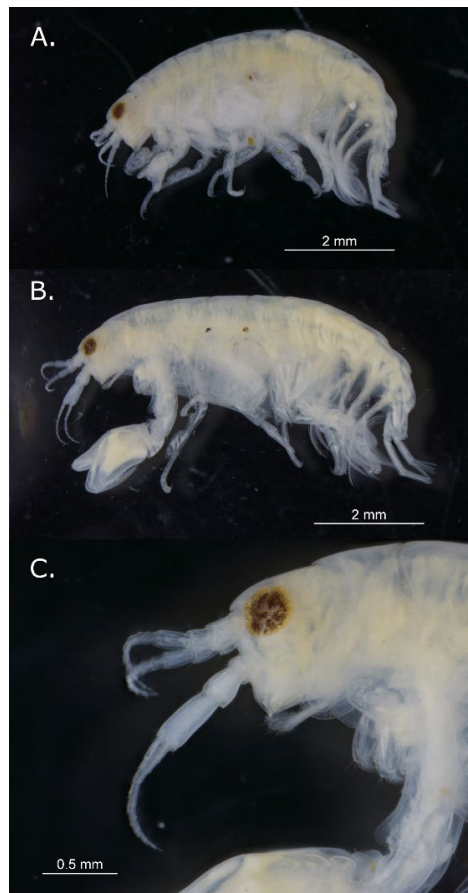


Figure 1. *Hyachelia tortugae* from Gorgona Island (CAN-UV 1756): a) female, b) male, c) male head. Photos by J.F. Ortega & B. Valencia, Laboratorio Imágenes Postgrado Ciencias Biología Univalle.

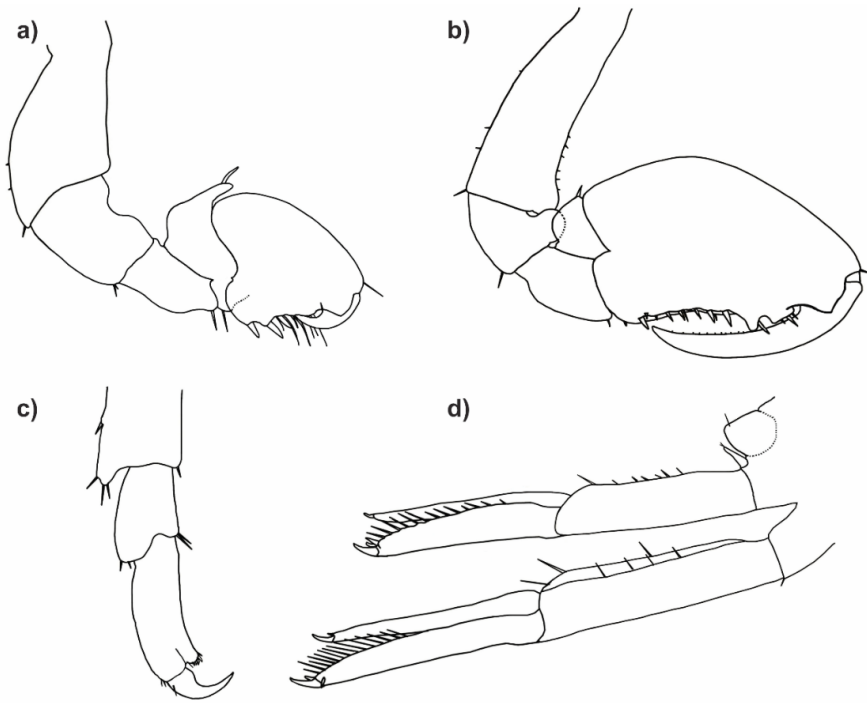


Figure 2. *Hyachelia tortugae* from Gorgona Island (male, CAN-UV 1755): a) gnathopod 1, b) gnathopod 2, c) dactylus of pereopod 7, d) uropods and telson.

In addition to *H. tortugae*, the hyperiids *Parascelus* sp., *Paralycaea gracilis* Claus, 1879, and *Schizoscelus ornatus* Claus, 1879 were identified from the esophageal lavages of green turtles from Gorgona Island (Table 1). Hyperiids present symbiotic associations with gelatinous zooplankton (HARBISON *et al.*, 1977) and were likely ingested when the turtles were feeding on gelatinous organisms. AMOROCHO & REINA (2007) reported that tunicates (salps and doliolids) were the main dietary component of green turtles in Gorgona Island, which were also found in some of the turtles lavaged during this study (SAMPSON *et al.*, 2017). The three hyperiids identified in this study have been previously reported by Valencia & Giraldo (2012) in the area, where *P. gracilis* was one of the five most abundant species.

Considering that sea turtles use Gorgona Island as a foraging, resting, and/or nesting site (AMOROCHO & REINA, 2007), characterizing the epibiont community associated with each species and understanding the nature of these associations could provide important insights on the habitat use and movements of the turtles, and could also serve as an indicator of their health status. Hence, systematic studies should be specifically designed for this purpose in the future to obtain a better description of

the epibionts found on the sea turtles that occur around Gorgona Island and in the Colombian Pacific in general.

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