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OCCURRENCE OF *Armases angustum* (SMITH, 1870) (DECAPODA, SESARMIDAE) IN TANKS OF *Guzmania* sp. (BROMELIACEAE) AT TROPICAL RAIN FOREST OF CHOCÓ (COLOMBIA)

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Abstract

Several Sesarmidae species live in phytotelmata as a strategy to avoid predation, find nutrients, and protect the juvenile. This study reports the occurrence of *A. angustum* to be associated with *Guzmania* sp. (Bromeliaceae) in rainforests of Colombia. *A. angustum* has morphological adaptations for climbing that allow access to bromeliads and other phytotelmata as other crab species reported in bromeliads and tree holes. Future research would be directed toward explaining the presence of *A. angustum* on bromeliads.

Key words: *Armases angustum*, Bromeliaceae, rainforest.

PRESENCIA DE *Armases angustum* (SMITH, 1870) (DECAPODA, SESARMIDAE) EN ESTANQUES DE *Guzmania* sp. (BROMELIACEAE) EN EL BOSQUE HUMEDO TROPICAL DEL CHOCÓ (COLOMBIA)

Resumen

Varias especies Sesarmidae viven en fitotelmata como una estrategia para evitar la depredación, hallar nutrientes, y proteger a los juveniles. El estudio muestra la presencia de *A. angustum* asociados con *Guzmania* sp. (Bromeliaceae) en las selvas de Colombia. *A. angustum* tiene adaptaciones morfológicas para la escalar que permiten el acceso a las bromelias y otras fitotelmata como otras especies de cangrejos reportados en bromelias y huecos de los árboles. Futuras investigaciones futura podría ser dirigida hacia la explicación de la presencia de *A. angustum*.

Palabras clave: *Armases angustum*, Bromeliaceae, bosque húmedo tropical.

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INTRODUCTION

Sesarmidae is a crab family inhabiting temperate and tropical regions. Sesarmid crabs are found in marine, freshwater, mangrove, and brackish habitats (ABELE, 1992; HARTNOLL, 1975; JONES, 1984; SCHUBART *et al.*, 2002), where they eat litter or detritus and tadpole (FRATINI *et al.*, 2005, GRAY & CHRISTY, 2000). In addition, several species of Sesarmidae live in phytotelmata; for example, *Labuanium rotundatum* (Hess, 1865) is associated with treeholes (NG & LIU, 2003), *Metopaulias depressus*, Rathbun, 1896 and *Armases angustipes*, Dana, 1852 live in bromeliads (DIESEL, 1989, 1992, 1997), and *Scandarma lintou*, Schubart *et al.*, 2003, *Labuanium scandens* Ng & Liu, 2003, *Labuanium gracilipes* H. Milne Edwards, 1853, and *Aratus pisonii* H. Milne Edwards, 1837 are associated to Pandanaceae (CUMBERLIDGE *et al.*, 2005; NG & LIU, 2003; SCHUBART *et al.*, 2003; THIERCELIN & SCHUBART, 2014). The family Sesarmidae includes around 31 genera, some of which are widely distributed in the Indo-Pacific region. In America, the family is represented by approximately 33 species, into in four genera, *Aratus* with 2 species, *Armases* with 13 species, *Metopaulias* with 1 species and *Sesarma* with 18 species (ABELE, 1992; NG *et al.*, 2008; DE GRAVE *et al.*, 2009; SCHUBART & SANTL, 2014; THIERCELIN & SCHUBART, 2014). The genus *Armases* contains two species that have been reported along the Pacific coastline of Colombia: *A. occidentale* (Smith, 1870) and *A. angustum* (Smith, 1870) (ABELE, 1992; LEMAITRE & ALVAREZ, 1992). The species *A. angustum* has been found in the Pacific coast region of Colombia (e.g., on Gorgona Island, Bahia Malaga) to be associated with mangrove trunks and plant detritus (LAZARUS & CANTERA, 2007; LEMAITRE & ALVAREZ, 1992). This study reports, for the first time, the occurrence of *A. angustum* to be associated with *Guzmania* sp. (Bromeliaceae) in rainforests of Colombia.

METHODS

The study was conducted in a tropical rainforest located around El Amargal Biological station (5°41'29.44" N 77°16'18.36"W) on the Pacific coast of the department of Chocó in Colombia. The area is characterized by a mature forest with a canopy height of 35-45 m.; *Brosimum utile* (Moraceae), *Wettinia quinaria* (Arecaceae), *Otoba novogranatensis* (Myristicaceae), *Cecropia hispidissima* (Cecropiaceae) are the more abundant plant species. The annual average temperature is 26.3°C and the average annual precipitation is 7245 mm. The precipitation regime is unimodal with a rainy season between April and November, and a humidity of 85% (VALLEJO *et al.*, 2005). Eleven plants of *Guzmania* sp. (Bromeliaceae) Ruiz & Pavón, 1802, were collected in April of 2012 to survey the fauna inhabiting them. The bromeliads were located at heights between 1 and 3 m above the ground level. They had an average height of 0.83 m, an average of 0.118 m^2 of coverage, an average leaf number of 27.6, and an average of 8.78 g of litter.

RESULTS

Armases angustum (Smith, 1870) (Fig. 1)

Fig. 1. *Armases angustum* (Smith, 1870), A, Ventral view of female; B, ventral view of male; C, dorsal view of female; D, dorsal view of male. Scales: 1,1 cm: 2, 1 cm.

Material examined. — Eight adult ♂♂ (cw 1.2 cm, cl 1.3 cm) and 3 adult ♀♀ (cw 1.0 cm, cl 1.1 cm). Colombia, Department of Chocó, Municipality of Nuquí, district of Arusí, El Amargal Biological station. 5°41'29 44"N 77°16'18.36"W. April 2012. Coll. Fabiola Ospina-Bautista, Emilio Realpe. All material was deposited in the Museo de Historia Natural, Universidad de los Andes, Bogotá, under accession no. ANDES-IN 2793.

Habitat. — These were collected from *Guzmania* sp. of the Pacific coast of Colombia.

General morphological characters — Carapace whit dorsal surface of carapace covered with granules (fig. 2A). Sexually dimorphic chelipeds; generally more robust in males than in females. In both sexes, medial posterior and lateral inferior sides has serrated edges. The anterior medial edge is armed with teeth and expanded distally, especially in males. Carpus covered with sharp granules. Chelae of both sexes covered with granules; dorsal surface of palm with a poorly row of sharp tubercles (fig. 2B). First male gonopod an amber color, consisting of two unequal lobes laterally compressed

with a medial groove; the shaft portions are membranous or weakly calcified (fig. 2 E-F)
Remarks. — The three females of *A. angustum* collected were found in 3 bromeliads *Guzmania* sp. and the eight males were found around bromeliads. The bromeliad community was dominated by immature Coleoptera and Diptera, *Scirtes* sp. (Helodidae), *Limonia* sp. (Tipulidae), and *Wyeomyia* sp. (Culicidae).

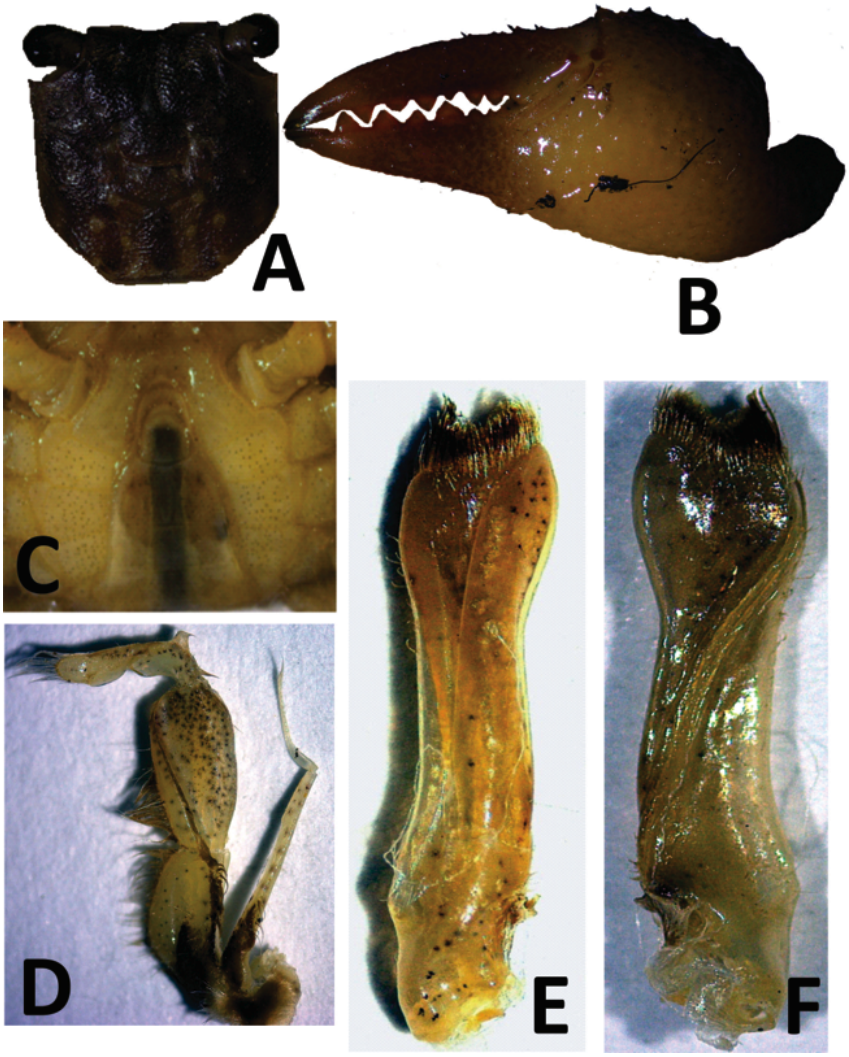

Fig. 2. A, Dorsal view of *Armases angustum (*Smith, 1870). (1) 0.75 cm.; B, Quelipod of *A. angustum,* male; C, Ventral view of *A. angustum* male; D, Third maxilipeds; E-F, Male Gonopods (Left).

DISCUSSION

There have not been reports for Colombia of crabs inhabiting bromeliads, despite the high diversity of decapods in Colombia (CAMPOS, 2005; CAMPOS *et al.*, 2005; LAMAITRE & ALVAREZ, 1992; VALENCIA & CAMPOS, 2007). Moreover, this is the first record of *A. angustum* living in Bromeliaceae. Like other species reported in bromeliads and treeholes, *A. angustum* has morphological adaptations for climbing that can allow access to the hearts of bromeliads and other phytotelmata. *Armases* species have a flattened and slightly broader than long carapace, long propodi, and short dactyli in the legs for climbing the tree stem (VANNINI *et al.*, 1997), mobile fingers often extended into the base with granules scattered on the dorsal surface, a second pair of pereiopods without pubescence on the dorsal surface of the propodus (ABELE, 1992). This strategy is relevant for avoiding predation, finding nutrients, protecting the juveniles, and colonizing new habitats such as the surface of the tree bark, bromeliads, and tree holes (CANNICCI *et al.*, 1999; ERICKSON *et al.*, 2003; HARTNOLL, 1988; VANNINI *et al.*, 1997; SIVASOTHI, 2000).

Future research would be directed toward explaining the presence of *A. angustum* on bromeliads. *A. angustum* has been reported to prey on *Dendrobates auratus* tadpoles in ephemeral pools of Panama (GRAY & CHRISTY, 2000). Thus, it is possible that the same behavior occurs with the individuals of *A. angustum* in the Pacific coast of Colombia, where the species *Dendrobates histrionicus* has been reported to occur (MÉNDEZ & AMÉZQUITA, 2014). Moreover, some species of Sesarmidae in Jamaica, such as *Metapaulius depressus*, use the phytotelm system to protect their offspring against predators (DIESEL, 1989, 1992). Therefore, in a similar fashion *A. angustum* may be using *Guzmania* sp. as a breeding habitat.

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