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First record of predation on the Cuban endemic freshwater crab *Epilobocera capolongoi* (Brachyura: Pseudothelphusidae)

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Abstract: The freshwater crab genus *Epilobocera* (Decapoda: Brachyura: Pseudothelphusidae) is endemic to the Greater Antilles, and the Cuban archipelago is the center of adaptive radiation of this group, with five species and several subspecies described so far. Despite these crabs seem quite common in freshwater ecosystems of these islands, little is known about their natural history. Herein we present the first record of predation by the Yellow-crowned Night-Heron, *Nyctanassa violacea* (Ardeidae), on *E. capolongoi*, a crab species restricted to the mountains of central Cuba. We also comment on the distribution and conservation status of this crab.

Keywords: Crustacea, Decapoda, natural enemy, threatened species, *Nyctanassa violacea*

Resumen: Primer registro de depredación sobre el cangrejo dulceacuícola endémico de Cuba Epilobocera capolongoi (Brachyura: Pseudothelphusidae). El género de cangrejos dulceacuícolas *Epilobocera* (Decapoda: Brachyura: Pseudothelphusidae) es endémico de las Antillas Mayores y el archipiélago cubano constituye el centro de radiación adaptativa de este grupo, con cinco especies y varias subespecies descritas hasta la fecha. A pesar de que estos cangrejos parecen ser bastante comunes en los ecosistemas de agua dulce de estas islas, se conoce muy poco sobre su historia natural. En este trabajo se reporta el primer caso de depredación por el guanabá real, *Nyctanassa violacea* (Ardeidae) sobre *E. capolongoi*, una especie de cangrejo restringida a las montañas del centro de Cuba. Además, se comenta sobre la distribución y estatus de conservación de este cangrejo.

Palabras Clave: Crustacea, Decapoda, enemigo natural, especie amenazada, *Nyctanassa violacea*.

The freshwater crab genus *Epilobocera* (Decapoda: Brachyura: Pseudothelphusidae) is exclusive to the Greater Antilles, with five species in Cuba and Isla de la Juventud (*E. capolongoi*, *E. cubensis*, *E. diazbeltrani*, *E. gertraudae*, and *E. gilmani*), two in Hispaniola (*E. haytensis* and *E. wetherbeei*) and one in Puerto Rico and Saint Croix (*E. sinuatifrons*) (Chace and Hobbs, 1969; Rodríguez and Williams, 1995; Pretzmann, 2000; Capolongo, 2003, 2005, 2014). This fact places the Cuban archipelago as the center of adaptive radiation of the genus, considering also that 12 subspecies have been described for *E. cubensis* (7) and *E. gilmani* (5) (Capolongo and Pretzmann, 2002; Capolongo, 2003, 2017). Nevertheless, Ng *et al*. (2008) recognized some of these subspecies as full species (*E. najasensis*, *E. placensis* and *E. synoecia*) and the subgenus *Neoepilobocera* as a valid genus. On the contrary, C. Magalhaes in Cumberlidge (2008) considered all Cuban taxa except *E. capolongoi* as a single species (*E. cubensis*), based on a supposed ongoing study by C. Schubart and D. Capolongo that actually does not exist (D. Capolongo, pers. comm., 2018). Nonetheless, all populations of *Epilobocera* in Cuba deserve further taxonomic revisions, which is crucial to know well the species boundaries and to establish conservation units. Until additional and conclusive evidences (morphological and/or molecular) arise we follow the classifications of Capolongo and Pretzmann (2002) and Capolongo (2003).

Despite *Epilobocera* crabs are relatively common in freshwater ecosystems of the island they inhabit in the Greater Antilles, little is known about their natural history. In Cuba several bird species have been reported as predators of decapod crustaceans, including crabs (e.g., Garrido and Kirkconnell, 2011), but in most cases their taxonomic identity remains unknown. Crocodiles (*Crocodylus acutus* and *C. rhombifer*) have been documented in Cuba as predators of *Aratus pisonii*, *Callinectes sapidus* and *Cardisoma guanhumi* (Soberón *et al*., 2001; Ramos, 2012; Alonso *et al*., 2014), and might prey on *Epilobocera* crabs as well, particularly *C. rhombifer*, the species most associated to freshwater ecosystems (Alonso *et al*., 2014). Finally, introduced feral mammals like dogs (*Canis lupus familiaris*) and pigs (*Sus scrofa*) might also constitute

predators of *Epilobocera* crabs in natural ecosystems, since they actually prey on land crabs such as *Cardisoma guanhumi* (Borroto-Páez, 2011).

Nonetheless, the only available information on the natural predators of *Epilobocera* crabs comes from a few sources. Abréu and Cruz (1988) and J. F. Milera in Abréu and Cruz (1988), found remains of "*Pseudothelphusa*" and "*Opiloboceras* sp." [sic] in fecal pellets of the Cuban Solenodon, *Solenodon cubanus* (Insectivora: Solenodontidae). However, since the genus *Pseudothelphusa* was ruled out from the freshwater crab fauna of Cuba (Capolongo, 2003), we assume that the crabs reported as prey of *S. cubanus* were all *Epilobocera*, most probably *E. c. cubensis* (Capolongo and Pretzmann, 2002; Capolongo, 2003), the closest taxon to the localities where the fecal samples of *S. cubanus* were obtained (Abréu and Cruz, 1988). Pérez-Osoria and Figueredo (2013) also reported *E. cubensis* in the diet of the invasive alien African catfish (*Clarias gariepinus*) at Leonero lagoon, north of the Cauto river delta, Granma province. Finally, Capolongo (2006) mentioned that local people from the region of Baracoa, eastern Cuba, consume crabs of the genus *Epilobocera*. Herein we report the third confirmed natural predator for any crab in the genus *Epilobocera*.

At 12:20 hours on 10 June 2018, we observed and filmed an adult Yellow-crowned Night-Heron (*Nyctanassa violacea*; Ardeidae) preying on a juvenile *E. capolongoi* (< 30 mm carapace width) (Fig. 1) at Charco Azul river (21.9621, -80.0432; 390 m a.s.l.; WGS 84), Guanayara Park, Topes de Collantes Protected Natural Landscape, Cumanayagua Municipality, Cienfuegos Province. When first seen the bird was actively foraging in a shallow torrent of the river and captured the crab between the rocks. *Nyctanassa violacea* was observed very common in the area, with permanent resident populations that even form nesting colonies in the nearby trees along the river. This bird has been reported as a crab predator before (e.g., Garrido and Kirkconnell, 2011), which joined to the fact that it co-occurs with *Epilobocera* crabs in most part of Cuba, suggest that this predator-prey relationship might be more frequent than previously thought.

FIGURE 1. Predation of a juvenile freshwater crab, *Epilobocera capolongoi* (Pseudothelphusidae), by the Yellow-crowned Night-Heron, *Nyctanassa violacea* (Ardeidae) at Charco Azul river, Guanayara Park, Topes de Collantes Protected Natural Landscape, Guamuhaya Massif, Cuba. Photograph: A. del Río Leal.
FIGURA 1. Guanabá Real, *Nyctanassa violacea* (Ardeidae) depredando un juvenil de cangrejo dulceacuícola, *Epilobocera capolongoi* (Pseudothelphusidae), en el río Charco Azul, Parque Guanayara, Paisaje Natural Protegido Topes de Collantes, Macizo de Guamuhaya, Cuba. Fotografía: A. del Río Leal.

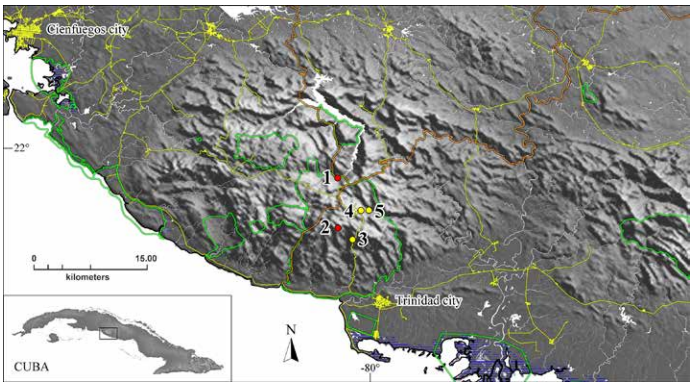

FIGURE 2. Map of the Guamuhaya Massif in central Cuba, depicting the distribution of *Epilobocera capolongoi* (Pseudothelphusidae) in the vicinity of Topes de Collantes, based on literature records (yellow dots) and this paper (red dots): 1) Charco Azul river, Guanayara Park, 2) Codina estate, 3) Mangos Nuevos, 4) El Gallo, and 5) Caburní stream. Green contours represent Protected Areas, orange contour province borders, blue horizontal lines swampy areas.
FIGURA 2. Mapa del Macizo de Guamuhaya en Cuba central, mostrando la distribución de *Epilobocera capolongoi* (Pseudothelphusidae) en los alrededores de Topes de Collantes, basada en registros de la literatura (puntos amarillos) y de este trabajo (puntos rojos): 1) río Charco Azul, Parque Guanayara, 2) Hacienda Codina, 3) Mangos Nuevos, 4) El Gallo, and 5) arroyo del Caburní. Los contornos verdes representan el sistema de áreas protegidas, los contornos naranjas los límites provinciales y las líneas azules horizontales zonas cenagosas.

This is also a new locality for *E. capolongoi*, ca. 5.5 km straight line NW of the nearest record at El Gallo, Topes de Collantes (Capolongo, 2003). We also observed the species in a tributary stream of Cañas River near Codina estate (21.8982, -80.0430; 720 m a.s.l.; WGS 84), ca. 3 km straight line SW of Topes de Collantes (Fig. 2).

Epilobocera capolongoi (Fig. 3) is known only from a few streams and rivers in the vicinity of Topes de Collantes, Guamuhaya Massif, between 390-650 m a.s.l. (Fig. 2; Pretzmann, 2000; Capolongo, 2003; this paper). It is considered one of the freshwater crab species with most restricted distribution in Cuba, together with *E. diazbeltrani* and *E.* (*Neoepilobocera*) *gertraudae*, the last two inhabiting natural limestone cavities filled with water in the hills north of Sierra Maestra, Santiago de Cuba province, and the area of Viñales, Pinar del Río province, respectively (Capolongo, 2003, 2005, 2006). Because of their restricted distributions, these three species might be seriously threatened. However, additional studies are needed to estimate population parameters and identify other possible threats both natural and anthropogenic affecting their populations and the associated habitat. Fortunately, all records of *E. capolongoi* fall within a protected area: Topes de Collantes Protected Natural Landscape (Fig. 2).

Figure 3. Adult specimen of *Epilobocera capolongoi* (Pseudothelphusidae) photographed at Charco Azul river, Guanayara Park, Topes de Collantes Protected Natural Landscape, Guamuhaya Massif, Cuba. This is one of the freshwater crab species with most restricted distribution in Cuba. Photograph: T. M. Rodríguez Cabrera.

Figura 3. Espécimen adulto de *Epilobocera capolongoi* (Pseudothelphusidae) fotografiado en el río Charco Azul, Parque Guanayara, Paisaje Natural Protegido Topes de Collantes, Macizo de Guamuhaya, Cuba. Esta es una de las especies de cangrejo dulceacuícola con distribución más restringida en Cuba. Fotografía: T. M. Rodríguez Cabrera.

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