

Occurrence of *Elaphoidella grandidieri* (Guerne and Richard, 1893) (Crustacea: Copepoda: Harpacticoida) in Ciénaga Grande de Santa Marta, Colombia

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ABSTRACT: The occurrence of *Elaphoidella grandidieri* (Guerne and Richard 1893) in Ciénaga Grande de Santa Marta, Colombia, is reported for the first time. The specimens are described and compared with literature data. The Colombian specimens are similar to those of previously described from Japanese populations, presenting strong spinulation of P2 exopod and absent inner seta on the first endopodal segment of P4. Nevertheless, this species presents some differences with the previous report. The present observations support the theory that *Elaphoidella grandidieri* might be a complex of species, reinforcing the necessity of a revision of the species.

Elaphoidella grandidieri (Guerne and Richard 1893) is considered a pantropical species (Gaviria and Aranguren 2007) originally described from Madagascar (Guerne and Richard 1893) and has also been recorded from Africa (Monard 1937; Chappuis 1938; Defaye 1988) and Japan, in Asia (Kikuchi 1985; Ishida 1990). In the American continent *Elaphoidella grandidieri* has been reported in Canada (Wilson 1975), Cuba and Guadeloupe (Dussart 1982; Reid 1990), United States (Reid and Ishida 1993; Williamson and Reid 2001), Brazil (Reid 1993; 1998), and México (Gutierrez-Aguirre *et al.* 2011). In Colombia, it was reported as personal observation (Gaviria and Aranguren 2007).

The present paper reports the occurrence of *Elaphoidella grandidieri* sampled from Ciénaga Grande de Santa Marta Magdalena-Colombia, during March–November 2009 in the mouth of Rio Sevilla (10°52'11.25" N and 74°19'31.64" W). The average deep was 0.6 m with pH range 7.1–7.2.

The samples were collected among submerged macrophytes doing a vertical drag with a 25 L bucket. With the use of 45 µm mesh size plankton net, 500 ml samples were concentrated and fixed immediately with 4% formalin, the samples were brought to the laboratory where they were stained with bengal rose. The specimens were separated and embedded in lactic acid for posterior dissection and photographic processing. Individuals were measured in ventral position, from head to the caudal rami, using an ocular micrometer.

Specimens were deposited at the Museo de Colecciones Biológicas de la Universidad del Atlántico, Barraquilla-Atlántico, Colombia (UARC78M).

The shape of the female is cylindrical (Figure 1A). The length ranges from 574 to 616 µm (n = 12). Short rostrum not surpassing the first segment of antennules (Figure 1B). Antennules with 8 segments (Figure 1C). Antenna with bisegmented allobasis, both segments almost equal

in length (Figure 1D). Exopodal antenna represented by a single segment arising from the middle of basoendopodite, armed with four spinulose setae (Figure 1E). Ventral surface of anal somite with 1-1 long spinules on posterior margin (Figure 1F). Anal plate strongly convex, rounded, pectinate (Figure 1G). Caudal rami length 1.3 times its width (Figure 1H). Exopods of P1–P4 all 3-segmented, first leg with 3-segmented endopodite, P2–P4 with 2-segmented endopodite. Basis of P1 with a seta as long as the first segment of P1 (Figures 2A–E), setae formulae P1–P4 similar to that reported by Gutierrez-Aguirre *et al.* (2011).

Basal expansion of fifth leg is rectangular, armed with four setae, exopod poses a row of inner spinules, with three long terminal setae, two short setae and one small spine outer margin (Figure 2F).

The specimens of *Elaphoidella grandidieri* from Colombia presents the following characteristics: the ratio between the outer spine of P1 exp3 and last segment is 0.86; the ratio of terminal seta of P2 endopodite and last segment is 3.5; the spinulation of P2 exopodite is strong; the inner seta on first endopodal segment of P4 is absent; the ratio between the length and width of P5 exp is 1.6; the ratio between the basoendopodite and exopodite inner seta of P5 is 1.8; the ratio between the outer lobe seta of P5 and exopodite is 2.08, the aesthetasc of fourth segment of antennules go beyond of the eight segment.

The Colombian specimens posses spines on the posteroventral margin of the anal somite; this character has only been reported by Chappuis (1938) in specimens collected from National Albert Park in the Congo-Africa, and Gutierrez-Aguirre *et al.* (2011) in specimens collected from ponds in central Mexico.

Elaphoidella grandidieri is similar to *E. bryophila* and key down to the latter species when following Wells (2007), an annotated checklist and keys to the species of

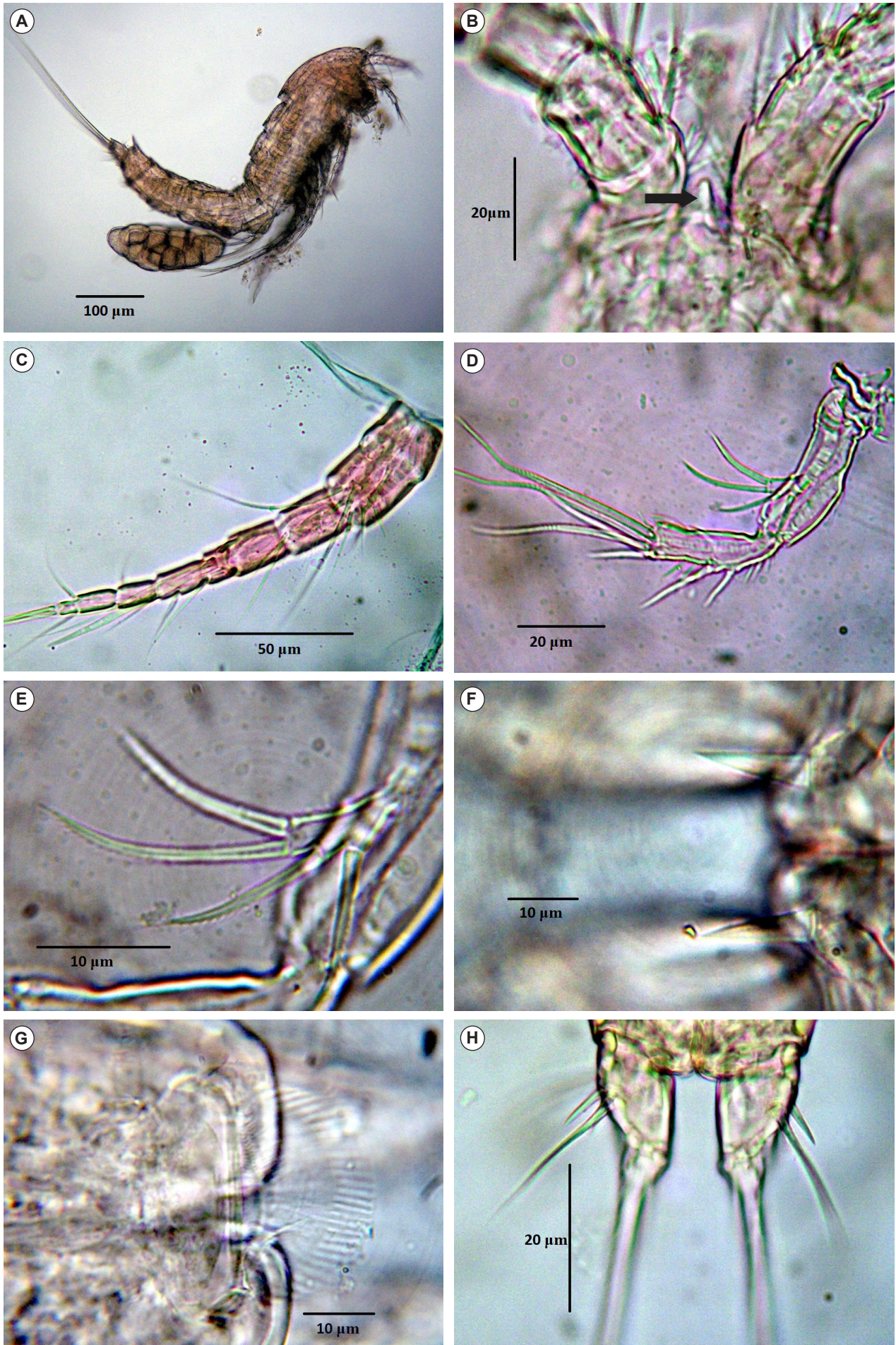


FIGURE 1. *Elaphoidella grandidieri*. Female. A. Adult. B. Rostrum C. Antennule. D. Antenna. E. Exopodal antenna. F. Spinules on posterior margin of anal somite. G. Anal plate. H. Caudal rami

Copepoda Harpacticoida (Crustacea) because both species share:

- 1) P2-P4 endopodal segment 2 with 5-6-4 setae,
- 2) P2-P4 endopodal segment 1 with 1-1-1 setae
- 3) P5 endopod and exopod with 4-6 setae, among other characters.

Elaphoidella grandidieri can not be confused with *E. bryophila*. In the latter, the female P5 exopod is subcircular, larger in breadth than in length, and the caudal rami is about twice in length than in breadth, in contrast with *E. grandidieri* the female P5 exopod is ovoid, larger in length than in breadth and length of the caudal rami is about 1.3 -1.5 times its breadth.

The male has not been recorded. However, eight females were observed with eggs, and, as assumed from

our data, *E. grandidieri* reproduces parthenogenetically. This fact have been documented by Nandini *et al.* (2011). Parthenogenesis has been observed only in a few species of harpacticoids such as *Elaphoidella bidens*, *Epactophanes richardi*, and *Canthocamptus staphylinus* (Sarvala 1979; Dole-Olivier *et al.* 2000).

The specimens of *Elaphoidella grandidieri* from Colombia are similar to those of Japanese populations reported by Kikuchi (1985) in the following characteristics: strong spinulation of P2 exp; absent inner seta on the first segment of P4 enp, in the ratio of terminal seta of P2 enp with the last segment and the ratio of length/width P5 exp. This species presents many differences with the reported species (Gutierrez-Aguirrez *et al.* 2011). For instance, the exopod of leg 5 is reported with four, five and six setae

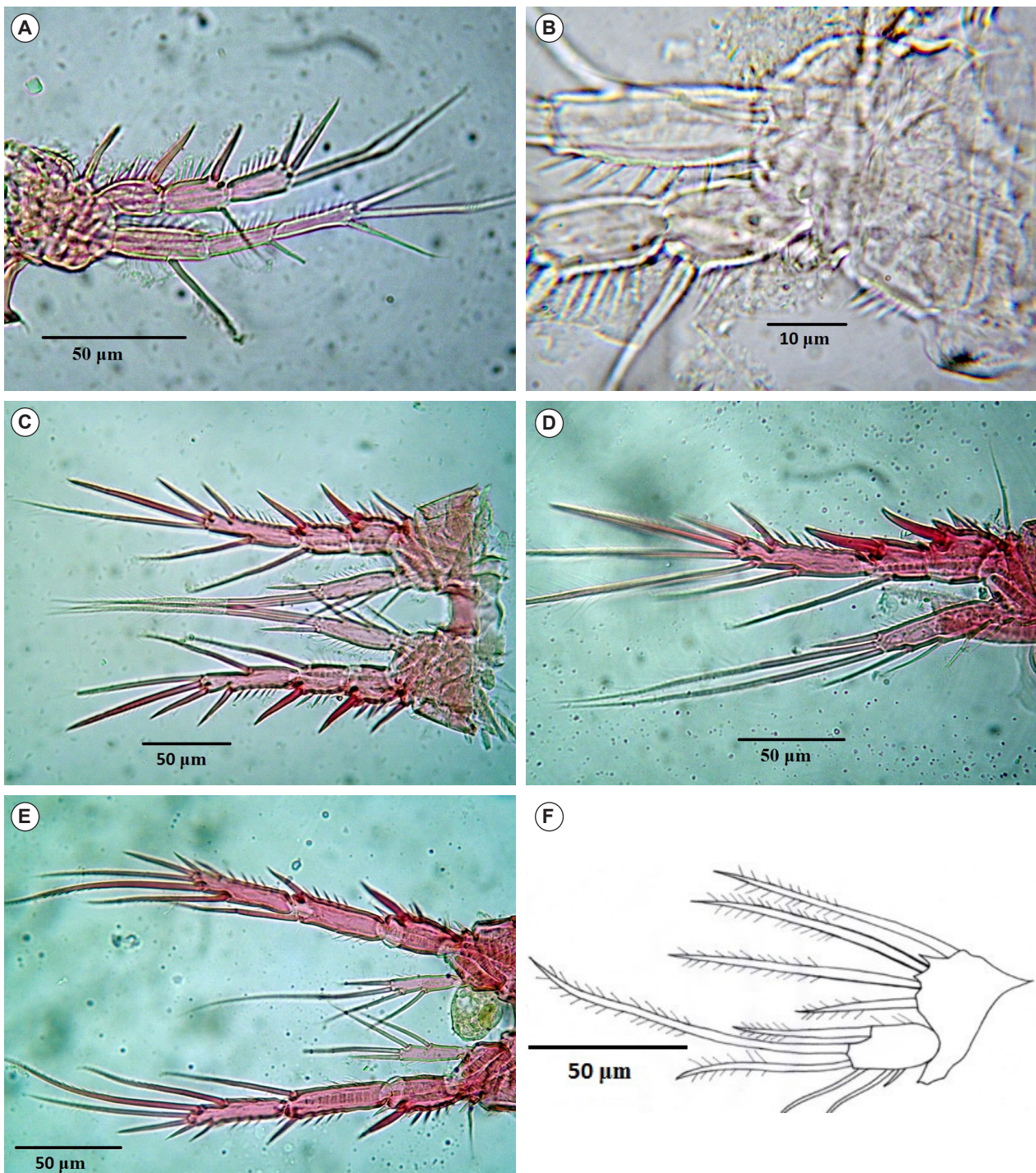


FIGURE 2. Legs 1-5 of *Elaphoidella grandidieri*. Female. A. Leg 1. B. Seta on basis of leg 1. C. Leg 2. D. Leg 3. E. Leg 4. F. Leg 5

(Guerne and Richard 1893; Ishida 1990; Wells 2007). However, the outer edge structures has been considered as true setae or spines or as accessory spinules such that it is likely that the true variation is from 4-6 true setae and spines (Wells 2007). Another variable structure is the first endopodal segment of leg 4 reported with or without seta (Ishida 1990; Sars 1904; Kikuchi 1985 and Gutierrez *et al.* 2011). This suggests that *Elaphoidella grandidieri* posses a high degree of variability in many characters and could belong to a species complex. However, further investigation is necessary to confirm that (Janetzky *et al.* 1996).

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RECEIVED: November 2012

ACCEPTED: July 2013

PUBLISHED ONLINE: December 2013

EDITORIAL RESPONSIBILITY: Rodrigo Johnsson and Vinicius Queiroz