

***Temnonotus simplex* A. Milne-Edwards, 1875, a junior synonym of *Temnonotus granulatus* A. Milne-Edwards, 1875 (Decapoda: Brachyura: Majidae)**

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Abstract

The genus *Temnonotus* A. Milne-Edwards, 1875 encompasses only two species, both endemic to the Western Atlantic: *T. granulatus* A. Milne-Edwards, 1875 and *T. simplex* A. Milne-Edwards, 1875. There is some controversy as to whether *T. granulatus* and *T. simplex* are both valid species. Altogether only five individuals of *Temnonotus* have been reported so far. The study of 25 additional specimens from the collections of the National Museum of Natural History, Smithsonian Institution, revealed that *T. simplex* should be considered a junior subjective synonym of *T. granulatus*.

Key words: biodiversity, taxonomy, synonymy, Crustacea, Majoidea, western Atlantic.

Introduction

The western Atlantic endemic genus *Temnonotus* was established by A. Milne-Edwards (1875: 82-84) for two species, *T. granulatus* A. Milne-Edwards, 1875 and *T. simplex* A. Milne-Edwards, 1875. Subsequently, *T. granulatus* was designated as the type species of the genus *Temnonotus* by Miers (1879). No additional species have been assigned to *Temnonotus* to date.

Altogether only five individuals of *Temnonotus* have been reported so far. The description of *T. granulatus* was based on a single female (cl 23 mm, cw 15 mm), caught near Barbados from 182 meters depth by the “Hassler” expedition in 1871. A much smaller specimen (male cl 12 mm, cw 8 mm) obtained in the same haul was the basis for the description of *T. simplex*. Rathbun (1925) compared the types of both species with two additional individuals, one male caught in Barbados in 1879 and one male collected in Havana in 1893. Although having considered *T. granulatus* and *T. simplex* as two separate species, she expressed the view that they were likely synonyms. Indeed, the distinguishing characters in Rathbun’s (1925) key to species of *Temnonotus* were actually extracted from A. Milne-

Edwards (1875: 84). Chace (1940) subscribed to the view that *T. simplex* should merge into synonymy with *T. granulatus* and attributed to it a male from off Playa Baracoa, Havana, taken by the “Atlantis” expedition during the years 1938-1939. Based on Chace’s (1940) comments, Powers (1977) listed *T. simplex* in the synonymy of *T. granulatus*. Felder *et al.* (2009) implied as much when referring to *T. granulatus* as the only *Temnonotus* occurring in the Florida Straits, Cuba, and Barbados. Contrary to these views Ng *et al.* (2008) treated *T. granulatus* and *T. simplex* as two distinct species, with no justification for that approach. Indeed, the suggestion that *T. granulatus* and *T. simplex* were conspecific has been based on scattered material only, and more material and study is needed before merging *T. simplex* into the synonymy of *T. granulatus*.

The existence of 9 males and 16 females in the collections of the National Museum of Natural History, Smithsonian Institution (USNM) prompted us to revisit the synonym between *T. granulatus* and *T. simplex*. The study of those 25 additional specimens lends support to the synonymy between *T. granulatus* and *T. simplex*.

Abbreviations: cl, carapace length; cw, maximal carapace width.

Family Majidae Samouelle, 1819

***Temnonotus* A. Milne-Edwards, 1875**

***Temnonotus granulatus* A. Milne-Edwards, 1875
(Figures 1-4)**

Temnonotus granulatus A. Milne-Edwards, 1875: 83, pl. 17, figs. 2-2c.

Temnonotus simplex A. Milne-Edwards, 1875: 84, pl. 17, fig. 3-3c.

Temnonotus granulatus – A. Milne-Edwards, 1880: 2; Rathbun, 1898: 255; 1925: 341, pl. 249, fig. 7-9; A. Milne-Edwards and Bouvier, 1923: 392; Chace, 1940: 65, fig. 22; Powers, 1977: 49; Ng *et al.*, 2008: 118; Felder *et al.*, 2009: 1076.

Material examined: Bahamas Island, Straits of Florida, off Little Bahama Bank, “Eastward”, stn 26549, 27°17'30N-79°12'30W, 30.iii.1975, 370 m, Chace, F.A. Jr. det.: 1 male (USNM 155620). Gulf of Mexico, “Silver Bay”, stn 5090, 30°04'N-88°41'W, 28.vi.1963, 18 m, Flat Trawl 2” mesh, Griffin O.R. det.: 1 oviger-

ous female (USNM 284185). Cuba, off Havana, Rathbun M.J. det.: 1 male (USNM 12599). Eastern coast of Nicaragua, “Oregon”, stn 4834, 14°14.8'N-80°28.5'W, 12.v.1964, 275-293 m, 6 ft tumbler dredge, Santana W. and Tavares M. det.: 2 males (USNM 1145764). Suriname, “Oregon”, stn 2289, 07°25'N-54°35'W, 08.ix.1958, 137-146 m, 40 ft flat trawl, Santana W. and Tavares M. det.: 7 males, 3 females, 10 ovigerous females, 3 young females (USNM 1145765).

Distribution: Atlantic Ocean in Bahamas Island, Gulf of Mexico, Cuba, Nicaragua, Barbados and Suriname, between 18 and 370 meters depth.

Remarks: The description of both *Temnonotus simplex* and *T. granulatus* was based upon one individual of each species. According to A. Milne Edwards (1875: 84) *T. simplex* and *T. granulatus* can be distinguished from each other as follows: “Cette petite espèce est plus allongée et moins bombée que le *Temnonotus granulatus*; le test est pauvre en granulations. Les cornes frontales sont plus fines et plus longues, il n’y a pas de sillon interorbitaire nettement dessiné. L’article basilaire de l’antenne externe est plus étroit et ne porte qu’une petite épine à son angle antéroexterne. Deux lignes



Figure 1. A-B, *Temnonotus granulatus* A. Milne-Edwards, 1875. A, male cl 37.5 mm, cw 24.5 mm (USNM 155620). B, male cl 29.3 mm, cw 19.5 mm (USNM 1145765). Scale bars: A-B, 5 mm.

de granulations existent sur le front et se continuent sur la région gastrique; celle-ci est garnie de quelques tubercules peu saillants; au contraire, une épine assez forte se détache de la région hépatique. Le sillon branchio-hépatique est large et profond. Les régions branchiales sont armées de plusieurs épines. Le lobe cardiaque antérieur est limité par

une dépression moins profonde et à parois moins abruptes que dans l'espèce précédente; ses bords ne sont pas marginés. Le lobe ainsi circonscrit, au lieu d'être aplati et granuleux, est fortement bombé, sa surface est lisse et ne porte qu'une granulation en avant, sur la ligne médiane; les bords de ce lobe sont cerclés par une ligne de petits poils droits et

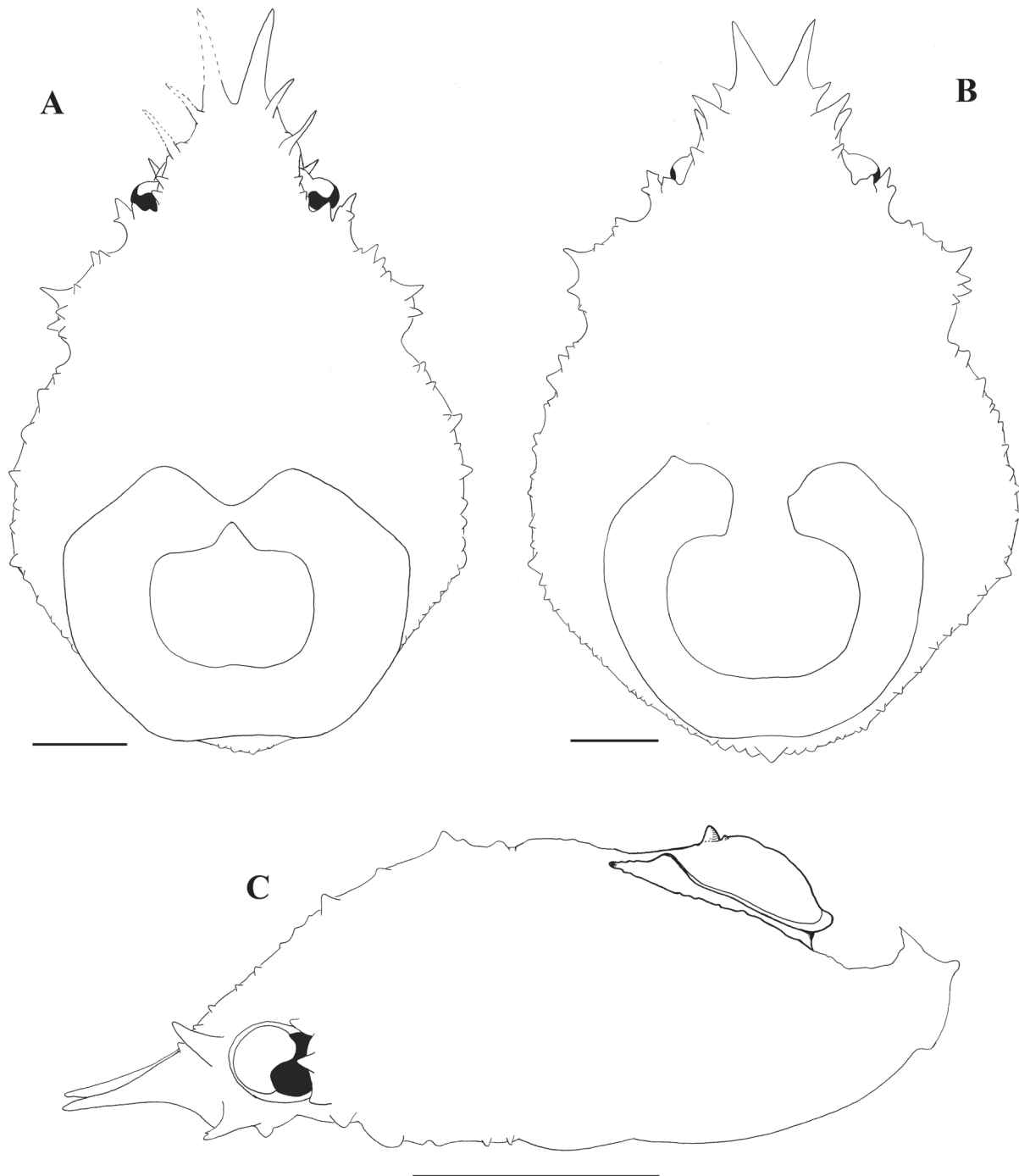


Figure 2. A-C, *Temnonotus granulatus* A. Milne-Edwards, 1875. A-B, dorsal view of the carapace. C, lateral view of the carapace. Setae not represented. Note the deep trench that surrounds the cardiac region is interrupted anteriorly. A, male (USNM 155620). B, male (USNM 1145764). C, male (USNM 72599). Scale bars: A-C, 5 mm.

roides [sic]. Sur le lobe urogastrique, il existe une épine médiane dirigée en arrière. Les pattes ressemblent à celles du *Temnonotus granulatus*.”

Actually, the examination herein of 25 additional specimens revealed that all the above mentioned differences between *Temnonotus simplex* and

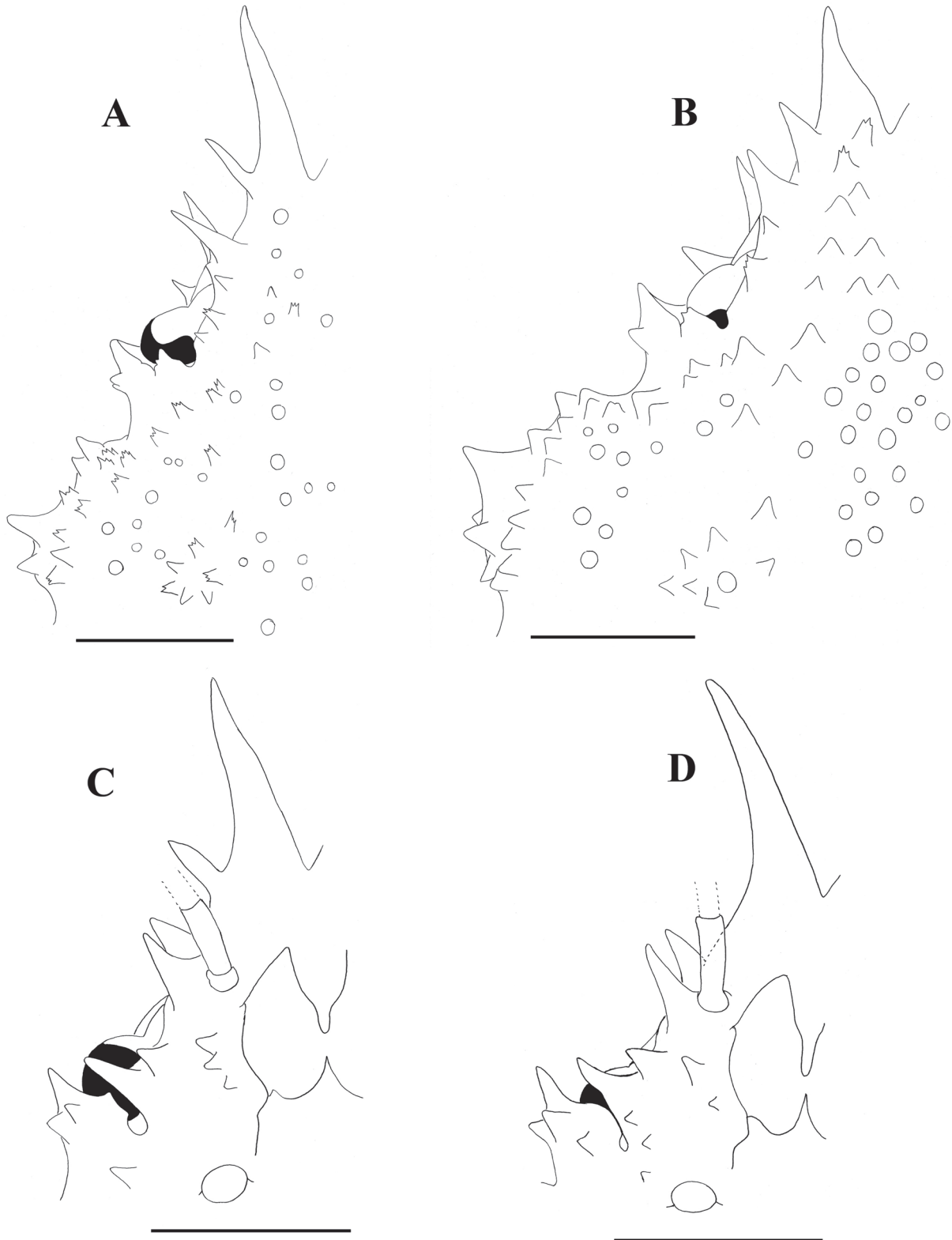


Figure 3. A-D, *Temnonotus granulatus* A. Milne-Edwards, 1875. A-B, anterior region of the carapace in dorsal view. C-D, anterior region of the carapace in ventral view. Setae not represented. Note the variation of the interorbital notch. A, C, male (USNM 155620). B, male (USNM 1145764). D, male (USNM 1145765). Scale bars: A-D, 5 mm.

T. granulatus are attributable to variation, lending support therefore to the synonymy between *T. granulatus* and *T. simplex*.

Carapace (Fig. 1): The convexity of the carapace varies between individuals of the same sex and size. Two males of similar size (USNM 1145764) proved to vary in the degree of granulation of the carapace. The female USNM 284185 has comparatively more dense granulation on the carapace and some of the carapace granules coalesce.

Rostrum (Figs. 1-4): Young individuals (USNM 1145765) have a more slender and longer rostrum than the adults. The adult male USNM 155620 has a more slender and longer rostrum than two males of about the same size (USNM 1145764). The accessory spine can be either present or absent in the anterolateral margin of the rostrum.

Orbit and antenna (Fig. 3): The interorbital notch is distinctly more marked in adults than in young specimens, but it also varies between adults. All the examined specimens show three spines on the lateral margin of the basal article of the an-

tenna, whereas the number of tubercles on the mesial margin vary between individuals. The posteriormost antennal spine is not always flanked by tubercles.

Front (Figs. 1, 3): Between the two frontal, longitudinal rows of granules there is either one longitudinal row of tubercles, some dispersed tubercles, or just a single tubercle.

Gastric and hepatic regions (Figs. 1-2): The density of tubercles on the gastric region is highly variable, ranging from a few to many tubercles, occasionally coalescent. The degree of development of the hepatic spine is variable as, for instance, in the female USNM 284185 in which the hepatic spine is only little developed.

Branchio-hepatic groove (Figs. 1-2): The width of the branchio-hepatic groove is variable between males of similar sizes (USNM 1145764).

Branchial region (Figs. 1-2): The spinulation of the branchial region varies between young and adult specimens, showing as spiny tubercles or scattered tubercles, respectively.

Cardiac region (Figs. 1-2): In most individuals the trench that surrounds the cardiac region is interrupted anteriorly either by a low or a high layer, whereas in both the male USNM 155620 and in some specimens from the lot USNM 11245765 that layer is incipient, so that the trench is almost complete. The walls of the trench do have raised rims, but in the two males USNM 1145764 and in the female USNM 284185 that rim is very low and in the male USNM 72599 it is almost non-existent.

Cardiac and urogastric lobes (Figs. 1-2): In the juvenile male USNM 72599 the cardiac lobe is markedly convex and armed anteriorly with one spine, it is otherwise smooth. In the remaining specimens, however, the surface of the cardiac lobe is generally granulated and armed with a tubercle instead of a spine. The degree of granulation of the cardiac lobe vary between individuals of the same sex and of similar size. In the examined specimens the edges of the cardiac lobe is not lined with setae, and the urogastric lobe has a low tubercle instead of a median spine.

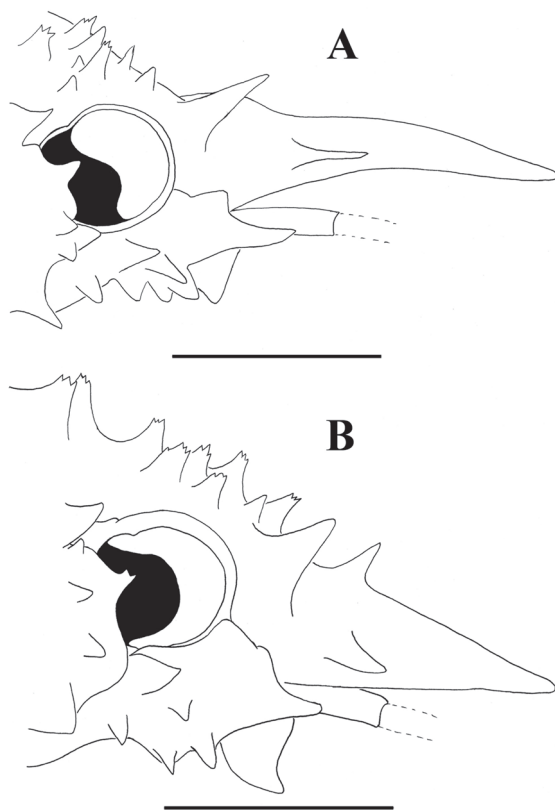


Figure 4. A-B, *Temnonotus granulatus* A. Milne-Edwards, 1875. A-B, anterior region of the body in lateral view. Setae not represented. Note the variation in the rostrum. A, male (USNM 155620). B, male (USNM 1145764). Scale bars: A-B, 5 mm.

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