

Alessandro Garassino* & Antonio De Angeli**

Ranilia constricta (A. Milne Edwards, 1880)
(Brachyura, Raninidae) from the Tyrrhenian
(Upper Pleistocene) of Bovetto (Calabria, S Italy)

Abstract – We report three specimens, discovered in the upper Pleistocene (Tyrrhenian) of Bovetto quarry, located close to Reggio Calabria (Calabria, S Italy). The study of these well-preserved three-dimensional specimens allowed assigning them to the Recent species *Ranilia constricta* (A. Milne Edwards, 1880) (Raninidae De Haan, 1839, Notopodinae Serène & Umali, 1972), widespread in Western Atlantic (Florida Straits and Yucatan Channel, Cuba, off Barbados, and Brazil), Central Atlantic (Ascension Island), and Eastern Atlantic (from Senegal to Congo). It is the first report of this species in the fossil record and in the Mediterranean area.

Key words: Crustacea, Decapoda, Brachyura, Pleistocene, Italy.

Riassunto – *Ranilia constricta* (A. Milne Edwards, 1880) (Brachyura, Raninidae) del Tirreniano (Pleistocene superiore) di Bovetto (Reggio Calabria, S Italia).

Descriviamo tre esemplari, rinvenuti nel Pleistocene superiore (Tirreniano) del giacimento di Bovetto, ubicato vicino a Reggio Calabria (Calabria, S Italia). Lo studio di questi esemplari tridimensionali e ben conservati ha permesso la loro attribuzione alla specie vivente *Ranilia constricta* (A. Milne Edwards, 1880) (Raninidae De Haan, 1839, Notopodinae Serène & Umali, 1972), diffusa nell'Atlantico occidentale (Florida, Canale dello Yucatan, Cuba, Barbados e Brasile), Atlantico Centrale (Isola dell'Ascensione), e Atlantico orientale (dal Senegal al Congo). Si tratta della prima segnalazione di questa specie nel record fossile e nell'area Mediterranea.

Parole chiave: Crustacea, Decapoda, Brachyura, Pleistocene, Italia.

Introduction

The studied specimens were collected in Bovetto quarry, located N of Reggio Calabria (Calabria, S Italy), known for its interesting marine fauna since the second half of Nineteenth Century. The Bovetto series, 45 m thick, preserves a rich malacological fauna characteristic of a warm climate with many specimens of *Strombus bubonius* Lamarck, typical gastropod from the Tyrrhenian (upper Pleistocene) of

* Museo di Storia Naturale, Corso Venezia, 55, 20121 Milano, Italy, e-mail: agarassino@libero.it

** Associazione Amici del Museo "G. Zannato", Piazza Marconi 15, 36075 Montebelluna Maggiore (Vicenza), Italy, e-mail: antonio_deangeli@virgilio.it

Mediterranean area. Rare fossil mammals, such as *Dama dama* cfr. *D. tiberina* and *Hippopotamus* cfr. *H. amphibius*, were discovered in the Bovetto series. Very rare decapod crustaceans, subject of this study, are sometimes discovered in the quarry.

Material

The studied specimens are three-dimensionally preserved and their preparation was easy due to the soft consistency of the surrounding matrix. The study of the three specimens, housed in the Palaeontological Collections of Museo di Storia Naturale di Milano (MNSN), permitted their identification with the Recent species, *Ranilia constricta* (A. Milne Edwards, 1880).

The systematic arrangement used in this paper follows the recent classification proposed by Martin & Davis (2001).

Systematic Palaeontology

Infraorder Brachyura Latreille, 1802
 Section Podotremata Guinot, 1977
 Subsection Archaeobrachyura Guinot, 1977
 Superfamily Raninoidea De Haan, 1839
 Family Raninidae De Haan, 1839
 Subfamily Notopodinae Serène & Umali, 1972

Included genera: *Cosmonotus* Adams & White, 1848 (fossil and Recent); *Erroranilia* Boyko, 2004 (fossil); *Eumorphocorystes* Binkhorst, 1857 (fossil); *Lianira* Beschin, Busulini, De Angeli, Tessier & Ungaro, 1991 (fossil); *Lovarina* Beschin, Busulini, De Angeli, Tessier & Ungaro, 1991 (fossil); *Notopella* Lörenthey, 1929 (fossil); *Notopus* De Haan, 1841 (fossil and Recent); *Pseudoraninella* Lörenthey in Lörenthey & Beurlen, 1929 (fossil); *Ranidina* Bittner, 1893 (fossil); *Ranilia* H. Milne Edwards, 1837 (fossil and Recent); *Raniliformis* Jagt, Collins & Fraaije, 1993 (fossil); *Umalia* Guinot, 1993 (fossil and Recent).

Genus *Ranilia* H. Milne Edwards, 1837

Discussion. The main previous diagnoses of this genus made by Rathbun (1937), Manning & Holthuis (1981), Williams (1984) and Melo & Campos Jr. (1994) did not consider the presence of spines on the orbital margins of the carapace because they were considered not important for the ascription of living specimens to this genus. Since the fossil crabs usually do not preserve sternal parts or gonopods (important morphological characters for the ascription of living specimens), only some morphological characters of the carapace are useful for their ascription to this living genus, as in the case of the studied specimens. So we emend the diagnosis of *Ranilia*, including those morphological characters useful for the ascription of the fossil specimens.

Diagnosis: carapace broadly oval or suboval, strongly convex from side to side, flattened, almost straight in midline; front slightly raised; orbits invisible from above, together forming inverted V directed obliquely ventral from rostrum;

rostrum slender, extending or not beyond innermost preorbital spine; supraorbital and extraorbital spines more or less strong and prominent or lacking (see *R. punctulata* and *R. guinotae*); anterolateral margin with one more or less prominent and elongate spine; posterolateral margin smooth and slightly sinuous; eye stout with eye-stalk strong and elongate; antennae directed forward, basal article somewhat dilated mesially; outer maxillipeds with third article longer than second; sternal plastron linear between second legs, broadened to slightly concave; hexagonal disk between third and fourth pairs; fifth legs not remarkably reduced; first right gonopod with conical distal region; abdomen short and narrow (modified from Melo & Campos Jr., 1994).

Type species: *Ranilia muricata* H. Milne Edwards, 1837, by monotype.

Included species: *R. angustata* Stimpson, 1860 (Recent); *R. constricta* (A. Milne Edwards, 1880) (fossil and Recent); *R. fornicata* (Faxon, 1893) (Recent); *R. guinotae* Melo & Campos Jr., 1994 (Recent); *R. muricata* H. Milne Edwards, 1837 (Recent); *R. punctulata* Beschin, Busulini, De Angeli & Tessier, 1988 (fossil); *R. saldanhai* Costa, 1970 (Recent).

Geographical distribution: Western Atlantic (Florida, Gulf of Mexico, Antilles, Colombia, and Brazil: *R. constricta*, *R. guinotae*, *R. muricata*, *R. saldanhai*), Central Atlantic (Ascension Island: *R. constricta*), Eastern Atlantic (from Senegal to Congo: *R. constricta*), Eastern Pacific (California Bay, Mexico, Ecuador and Galapagos Islands: *R. angustata*, *R. fornicata*).

Ranilia constricta (A. Milne Edwards, 1880)

Figs. 1-3

1880 – *Raninops constrictus* A. Milne Edwards; p. 35

1883 – *Notopus* (*Raninoides*?) *atlanticus* Studer; p. 17, Pl. 1 (fig. 5 a, b), **nov. syn.**

1889 – *Raninoides atlanticus* Studer in Studer; p. 48, 50, Pl. 24 (fig. 7)

1923 – *Ranilia constricta* (A. Milne Edwards) in A. Milne Edwards & Bouvier; p. 302, Pl. 1 (figs. 11-13), Pl. 3 (figs. 2-5)

1937 – *Ranilia constricta* (A. Milne Edwards) in Rathbun; p. 20, Pl. 4 (fig. 5), Pl. 5 (figs. 1-2)

1939 – *Notopus atlanticus* Studer in Gurney; p. 103 (listed)

1956 – *Ranilia atlantica* (Studer) in Monod; p. 631, Text-figs. 17-18

1958 – *Ranilia atlantica* (Studer) in Longhurst; p. 87

1962 – *Ranilia atlantica* (Studer) in Rossignol; p. 113 (listed)

1970 – *Ranilia constricta* (A. Milne Edwards) in Gomes Corrêa; p. 2, Pls. 1-2, Pl. 7 (figs. 56-58)

1970 – *Ranilia atlantica* (Studer) in Gomes Corrêa; p. 5

1970 – *Ranilia constricta* (A. Milne Edwards) in Gomes Corrêa; p. 2

1970 – *Ranilia constricta* (A. Milne Edwards) in Pequegnat; p. 180

1970 – *Ranilia constricta* (A. Milne Edwards) in Fonseca; p. 47

1972 – *Ranilia constricta* (A. Milne Edwards) in Coelho & Ramos; p. 178

1977 – *Ranilia constricta* (A. Milne Edwards) in Powers; p. 24

1997 – *Ranilia constricta* (A. Milne Edwards) in Spivak; Tab. 1

1980 – *Ranilia constricta* (A. Milne Edwards) in Rodriguez; p. 247

1981 – *Ranilia constricta* (A. Milne Edwards) in Manning & Holthuis; p. 7, Text-figs. 1-2

1984 – *Ranilia constricta* (A. Milne Edwards) in Williams; p. 265, Text-fig. 196

1985 – *Ranilia constricta* (A. Milne Edwards) in Soto; Tab. 1

1986 – *Ranilia constricta* (A. Milne Edwards) in Abele & Kim; p. 455, Text-figs. b-c

1989 – *Ranilia constricta* (A. Milne Edwards) in Coelho, Ramos-Porto & Melo; p. 26

1989 – *Ranilia constricta* (A. Milne Edwards) in Melo, Veloso & Oliveira; p. 3

1989 – *Ranilia constricta* (A. Milne Edwards) in Williams, Abele, Felder, Hobbs Jr. & Manning; p. 77

1990 – *Ranilia constricta* (A. Milne Edwards) in Manning & Chace Jr.; p. 44, Text-fig. 25

- 1990 – *Ranilia constricta* (A. Milne Edwards) in Werding & Muller; p. 217, Text-figs. 5 a, b
 1994 – *Ranilia constricta* (A. Milne Edwards) in Melo & Campos Jr.; p. 63
 1996 – *Ranilia constricta* (A. Milne Edwards) in Melo; p. 113
 1998 – *Ranilia constricta* (A. Milne Edwards) in Camp, Lyons & Perkins; p. 145
 2001 – *Ranilia constricta* (A. Milne Edwards) in Klein, Borzone & Pezzuto; Tab. 1
 2003 – *Ranilia constricta* (A. Milne Edwards) in Nizinski; p. 120
 2005 – *Ranilia constricta* (A. Milne Edwards) in McLaughlin *et al.*; p. 31
 2007 – *Ranilia constricta* (A. Milne Edwards) in Garassino & De Angeli; p. 43, Tex-figs. 1 A-D

Occurrence and measurements: we ascribe to this species three specimens (MSNM i13278, i22853, i22854) from the Tyrrhenian (upper Pleistocene) of Bovetto (Reggio Calabria, S Italy).

The sizes are expressed in millimetres.

MSNM i13278: $W_1=13$

MSNM i22853: $W_1=12$; $W_3=12$; $W_4=4$; $L_1 > 15$

MSNM i22854: $W_1=15$; $W_2=7$; $W_3=16$; $W_4=5$; $L_1 > 22$

Discussion. The studied specimens show the following morphological characters: carapace suboval, strongly convex from side to side, flattened, almost straight in midline; front slightly raised; anterolateral margins of carapace subparallel and posterolateral margins convergent; maximum width of carapace between lateral spines; preorbital, supraorbital, and extraorbital spines strong and prominent;

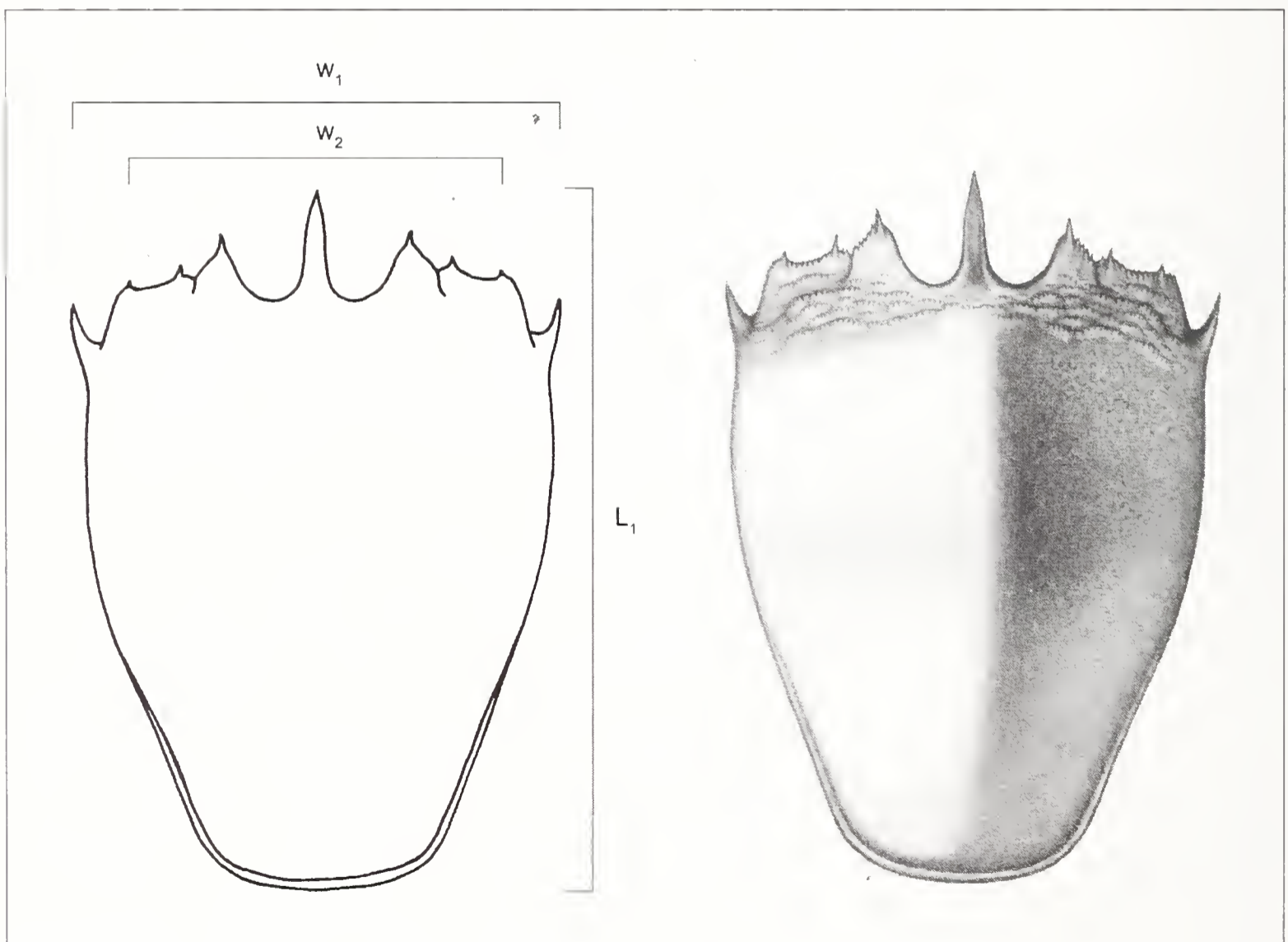


Fig. 1 - *Ranilia constricta* (A. Milne Edwards, 1880). Left: sketch of the carapace and examined sizes: W_1 = maximum width of the carapace; W_2 =frontal-orbital width; L_1 =maximum length of the carapace. (A sinistra: schema del carapace e delle misure considerate: W_1 =massima larghezza del carapace; W_2 =larghezza fronto-orbitale; L_1 =lunghezza massima del carapace). Right: reconstruction of the carapace (A destra: ricostruzione del carapace).

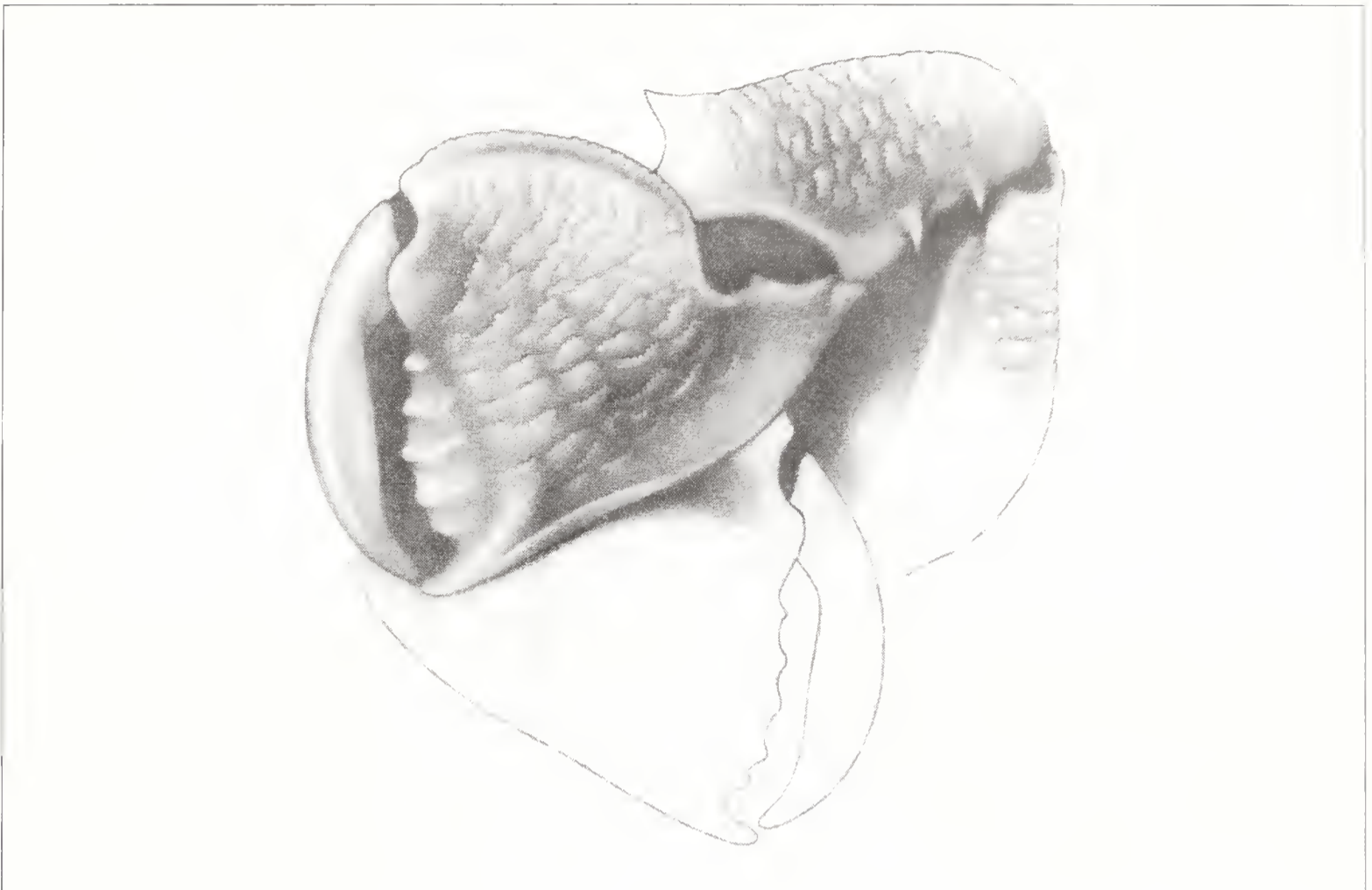


Fig. 2 - *Ranilia constricta* (A. Milne Edwards, 1880), reconstruction of the cheliped (ricostruzione del chelipede).

anterolateral margin with one spine prominent and elongate; orbits forming inverted V directed obliquely ventral from rostrum; dorsal surface of rostrum smooth; chelipeds stout having surface ornamented with tubercles and ciliate lines; movable finger of chela unarmed; palm of chela higher than long with ventral margin terminating in a strong spine, and with opposable margin not armed with teeth; merus of cheliped with blunt dorsal spine.

The above-mentioned morphological characters are typical of *Ranilia constricta* (A. Milne Edwards, 1880) to which the studied specimens are ascribed. This species is widespread in the Western Atlantic (to Florida Straits and Yucatan Channel, Cuba, off Barbados, and Brazil), Central Atlantic (Ascension Island), and Eastern Atlantic (from Senegal to Congo). At present, only one species is recognised in the fossil record, *R. punctulata* Beschin, Busulini, De Angeli & Tessier, 1988, from the lower Eocene (Ypresian) of Valle del Chiampo (Vicenza, N Italy) (Beschin *et al.*, 1988), since Feldmann & Maxwell (1990) ascribed *R. pororariensis* Glaesner, 1980, from the upper Eocene of New Zealand to *Laeviranina* Lörenthey & Beurlen, 1929. Müller (1993) ascribed some specimens from the Pliocene of Spain to *Ranilia*, but this ascription is still uncertain. Portell & Roger (2003) published a peer-reviewed abstract on the frog crab *Ranilia* from the Pliocene of Florida (United States), and, as reported by Portell & Agnew (2004), a new fossil species will be described.

The problematic albuneid *Paralbunea* Hu & Tao, 1996 (*P. taipeiensis* Hu & Tao, 1996, type species) from the lower Miocene of Taiwan, was considered to be an homonym genus of *Paralbunea* Serène, 1977 (Schweitzer & Boyko, 2000). Boyko (2004) reviewed the type specimens of *P. taipeiensis* Hu & Tao, 1996, including this species among the Raninidae. He pointed out that the morphologi-

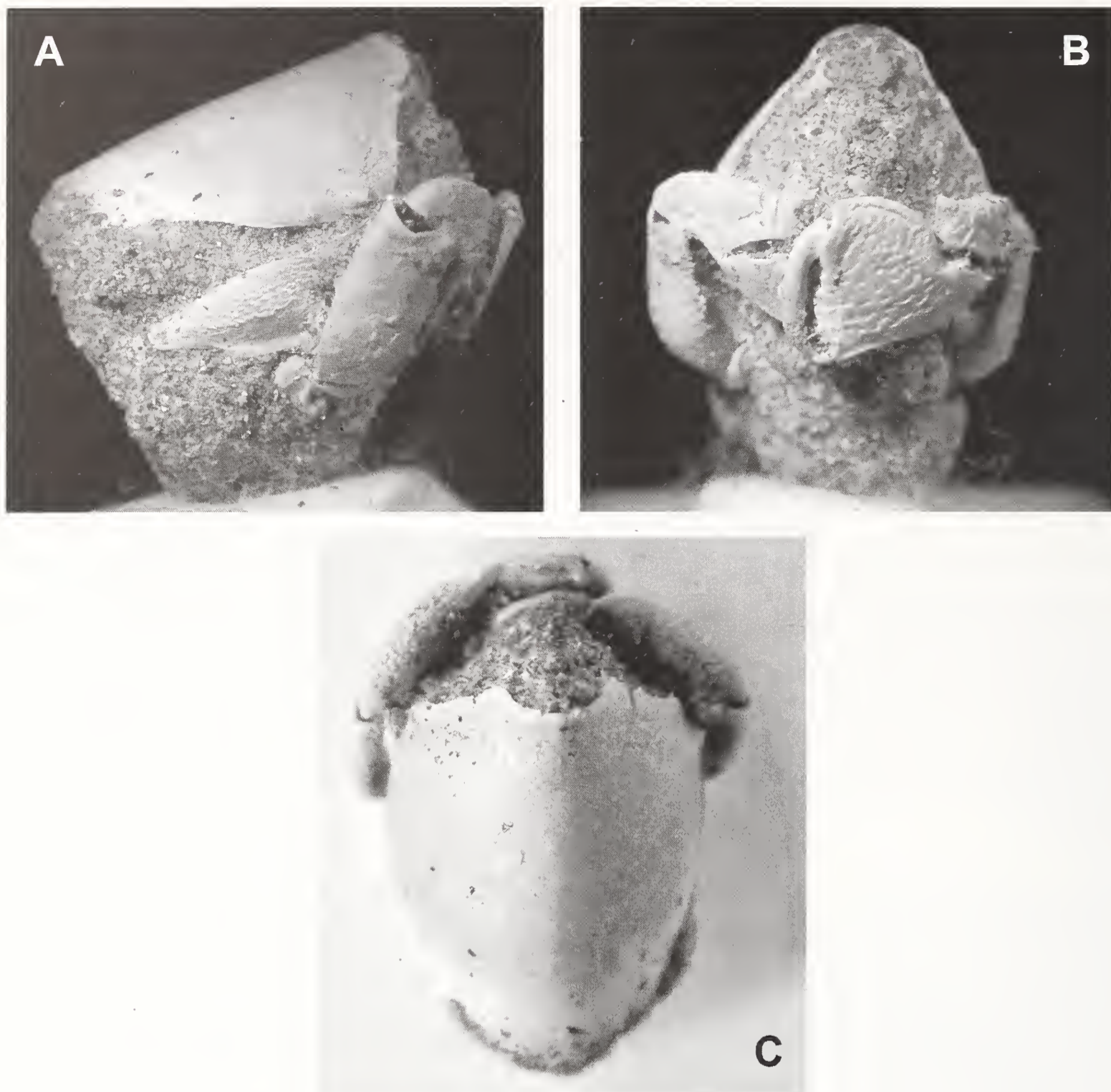


Fig. 3 - *Ranilia constricta* (A. Milne Edwards, 1880), MSNM i22853. A) carapace in lateral view (carapace in norma laterale) (x 3). B) carapace in frontal view (carapace in norma frontale) (x 3). C) carapace in dorsal view (carapace in norma dorsale) (x 3).

cal characters of the holotype (Hu & Tao, 1996, Pl. 11, figs. 2, 3) are so similar to those of *Ranilia* that he introduced the new name *Erroranilia taipeiensis* (Hu & Tao, 1996). The paratype of *P. taipeiensis* (Hu & Tao, 1996, Pl. 11, figs. 4, 6) was instead ascribed with some doubts to the Recent *Cosmonotus grayi* Adams & White, 1848 (Boyko, 2004). Even though, the plates of the type specimens of *P. taipeiensis* exhibit poor preservation, the arrangement of supraorbital margins is almost rectilinear and not directed backward as in *Ranilia* and *Cosmonotus*. This observation could suggest an ascription of this species to the recent *Umalia* Guinot, 1993, which is widespread in Indo-Pacific area and discovered from the Pleistocene of Japan (Karasawa, 2000).

Notopella Lörenthey & Beurlen, 1929 (*N. vareolata* Lörenthey & Beurlen, 1929, type species) was synonymised with *Ranilia* by Glaessner (1969) and Müller & Collins (1991), while Via Boada (1965, 1969), Jagt *et al.* (1993), and Tucker (1998) considered *Notopella* Lörenthey, 1929, a valid genus within the subfamily Notopodinae.

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