

Decapod Crustaceans from the Seroe Domi Formation (Mio-Pliocene) of Aruba, Netherlands Antilles

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ABSTRACT.—Fossil decapod crustaceans are described from Aruba, Netherlands Antilles, for the first time. All specimens come from the Mio-Pliocene Seroe Domi Formation. A callianassid mud shrimp, "*Callianassa*" sp., is represented by two chelae. The types of a new species of calappid, *Mursia creutzbergi*, consist of a pair of carapaces. The subovate carapace lacks lateral spines. *Mursia creutzbergi* is the second and youngest known member of the non-spinose group within this genus to be described from the Caribbean, and represents the fifth in total; such *Mursia* species may be worthy of description as a new genus.

KEYWORDS.—Systematics, Neogene, crabs, *Mursia*, *Callianassa*

INTRODUCTION

Fossil crustaceans are poorly known from the Cenozoic of the ABC Islands (Aruba, Bonaire, Curaçao) in the southern Caribbean. Rutten (1931) included no records of crustaceans in his review of the paleontology of the islands. Although de Buissonjé (1974:table 2; pl. 7, fig. 9) listed two taxa of balanid barnacles from the Mio-Pliocene Seroe Domi Formation of the ABC Islands, *Balanus* sp. (Aruba, Curaçao) and *Pyrgoma* sp. (Curaçao only), they were not described. Recently, Harper et al. (2003) mentioned the occurrence of decapods and cirripedes in the Seroe Domi Formation of Curaçao.

We therefore consider it of relevance to describe a small collection of decapod crustaceans from the Seroe Domi Formation of Aruba belonging to the Nationaal Natuurhistorisch Museum, Leiden (RGM). Although only two taxa are involved, one is described as a new species, the other being left in open nomenclature.

Locality and horizon

Data associated with the specimens state "Aruba. Pliocene. Rooi Taki. L. oever," that is, they were collected from the left bank of the River Taki. The Rooi Taki flows west into the wetlands, now a bird refuge, north of Pos Chiquito. This is in the middle of southwest Aruba; the approximate position of this locality is indicated in Fig. 1. It is not known which bank was 'left.' The associated fauna includes benthic Mollusca and echinoids.

The Miocene-Pliocene sedimentary rocks of Aruba belong to the Seroe Domi Formation (de Buissonjé 1974; Herweijer et al. 1977). This formation represents a series of submarine fore reef talus fans formed from reef and pebble debris arrayed as large scale foreset beds that show original depositional dips. Although this unit extends from the Middle(?) or Upper Miocene to the Upper Pliocene, most exposures on Aruba are in the middle and upper (= Pliocene) portions of the formation (Jackson and Robinson 1994:fig. 14.2(b)).

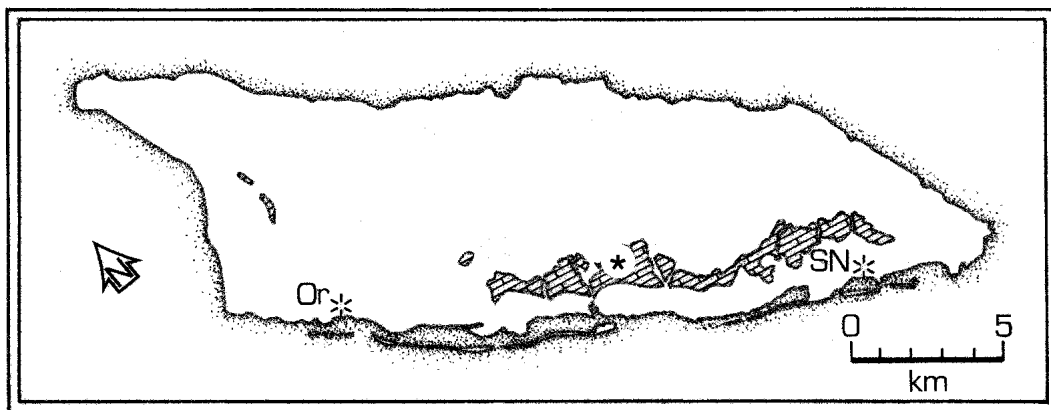


FIG. 1. Outline map of Aruba, showing the outcrop of the Mio-Pliocene Seroe Domi Formation (oblique brick sculpture) (simplified after Herweijer, 1979:pl. 3; see also Helmers and Beets, 1977:pl. 4; Jackson and Robinson, 1994:fig. 14.2(a)). The approximate position of the decapod crustacean fossil locality is marked by an asterisk (*). Key: Or = Oranjestad; SN = Sint-Nicolaas; coastline stippled.

SYSTEMATIC PALEONTOLOGY

Order DECAPODA Latreille
 Infraorder THALASSINIDEA Latreille
 Family CALLIANASSIDAE Dana sensu lato
 Genus *Callianassa* Leach, 1814

Type species—*Cancer (Astacus) subterraneus* Montagu, 1808, by monotypy.

"*Callianassa*" sp.
 Fig. 2a, b

Material—Two internal molds of fragmentary left propodi, RGM 283591 and 283592 (Figs. 2a, b, respectively).

Locality and horizon—Rooi Taki, 'left' bank, southwest Aruba. Seroe Domi Formation. Mio-Pliocene.

Description—Manus subquadrate in outline, outer surface smoothly convex; inner surface gently convex medially, becoming weakly concave towards the fixed finger. Upper margin straight with a rounded edge; lower margin weakly concave before the fixed finger and finely granulated along the inner edge. A deep sulcus bounds the carpal articulation; the interdigital margin is not preserved. Triangular fixed finger about one third the length of manus and a little inturned. Length of RGM 283591, in-

cluding fixed finger, c. 15.7 mm; proximal height, c. 11.0 mm.

Remarks—We follow the recommendation of Collins et al. (1996:52) in leaving these specimens in open nomenclature, in recognition of the difficulty of placing such fragmentary material into one of the numerous callianassid genera/subgenera based mainly on complete Recent material. However, a detailed description and related illustrations (Fig. 2a, b) are provided for comparative purposes.

Section EUBRACHYURA de Saint Laurent

Infraorder BRACHYURA Latreille
 Superfamily CALAPPOIDEA de Haan
 Family CALAPPIDAE de Haan
 Genus *Mursia* Leach in Desmarest, 1823

Type species—*Mursia cristata* H. Milne Edwards, 1837, by subsequent designation (H. Milne Edwards, 1837, loc. cit. Glaessner, 1969:R494).

Diagnosis—See Collins and Donovan (2002:145).

Range—Middle(?) Eocene to Recent.

Mursia creutzbergi sp. nov.
 Fig. 2c, d

Material—Holotype, RGM 283593, an abraded internal mold of a carapace (Fig.

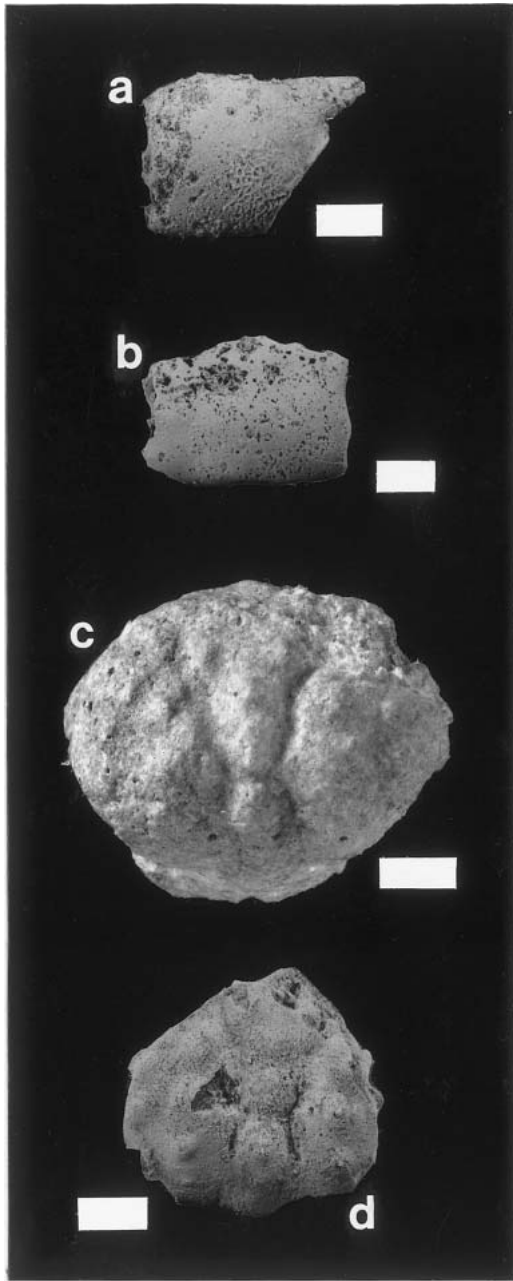


FIG. 2. Decapod crustaceans from the Seroe Domi Formation (Mio-Pliocene) of Aruba. a, b, "*Callianassa*" sp., fragmentary left propodi. a, RGM 283591. b, RGM 283592. c, d, *Mursia creutzbergi* sp. nov. c, RGM 283593, holotype, internal mold of carapace. d, RGM 283594, paratype, median portion of carapace. Scale bars represent 5 mm.

2c). Paratype, RGM 283594, median portion of a carapace (Fig. 2d).

Locality and horizon—Rooi Taki, 'left' bank, southwest Aruba. Seroe Domi Formation. Mio-Pliocene.

Etymology—For Mr. Peter Creutzberg, collector of the specimens described herein.

Diagnosis—Carapace subovate, a little wider than long; lacking lateral spines; two pairs of lateral furrows present, the inner pair the deeper. Two pairs of tubercles on protogastric lobes.

Description—Carapace transversely subovate, slightly broader than long, widest just anterior to mid-length, longitudinally more steeply arched anterior to midlength; moderately arched transversely. Short, beaded anterolateral margins pass smoothly into almost straight posterolateral margins converging to sharp posterior angles. Posterior angles leading to an almost straight posterior margin. The lateral edges are sharp and the sides moderately inflected. Dorsal surface divided into five by two pairs of furrows, the inner pair deeper. The cervical furrow, shallow and concave across the midline deepens considerably at the basal mesogastric 'angles', curves forward and outward to junction with the hepatic furrow, then turning outwards, reaches the margin in two shallow loops. The equally deep hepatic furrows curve towards the frontal margin. The narrow median lobes are distinctly separated, with a tubercle on the near-circular mesogastric lobe, the ovate urogastric lobe has a single tubercle and there are two more in line on the cardiac region. An inner row of tubercles formed by one on the protogastric lobe, one on the mesobranchial lobe and three, becoming less prominent on the metabranchial lobe. The outer row of smaller tubercles comprises one on the hepatic region, one epibranchial and three on the metabranchial lobe. Additionally, there is a pair of small tubercles on each protogastric lobe in advance of the above mentioned pair and one other hepatic tubercle.

Remarks—Despite the relatively poor state of preservation, the holotype carapace retains sufficient characters for confident taxonomic placement among the fossil *Mursia* species in the group, having no lat-

eral spines which are otherwise considered normal to fossil and Recent species of the genus (Schweitzer and Feldmann 2000). The surface sculpture of *Mursia creutzbergi* sp. nov. compares closely with that of *Mursia granulosa* Collins and Donovan, 2002, from the Upper Oligocene of Antigua, but there is no indication of the secondary granulation that distinguishes the older species. *Mursia aspinia* Schweitzer and Feldmann 2000, from the Eocene Hoko River Formation of Washington State, has a similar arrangement of principal tubercles, but has an additional pair of protogastric tubercles situated close to the midline and with three tubercles aligned on the cardiac region. Carinated rows of tubercles immediately distinguish *Mursia bekenuensis* Collins (in Collins et al. 2003) from the Miocene of Sarawak. *Mursia* sp. nov. (vide Schweitzer and Feldmann 1999), from Pleistocene deposits of Guam, has a tubercle partially encircled by further tubercles on the metabranial lobe.

A possible separation of the two, atypical non-spinous species then known from *Mursia* was indicated by Schweitzer and Feldmann (2000). Now, the widely distributed, non-spinous species, represented by five fossil taxa as opposed to eight typically spinous, range from the Upper Eocene of the northwestern U.S.A. to the Pleistocene of the Far East, and westwards to the Oligocene and Pliocene of the Caribbean, Miocene of Europe and Japan. This group of taxa not only supports the view of Schweitzer and Feldmann, but also suggests that the separation and development of typical forms occurred by the Oligocene; after which, the two morphological groups continued a parallel geographical expansion, with the typical spinose *Mursia* taxa becoming a dominant group. Harper et al. (2003) mentioned the presence of calappid chelipeds and fingers in the Seroe Domi Formation of Curaçao; however, it is not known if these specimens are conspecific with *M. creutzbergi*.

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