Description of four new species of Muricidae (Mollusca, Gastropoda) from the Philippines and the Caribbean area

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Merle D. & Garrigues B. 2011. — Description of four new species of Muricidae (Mollusca, Gastropoda) from the Philippines and the Caribbean area. *Zoosystema* 33 (4): 557-575. DOI: 10.5252/z2011n4a7.

ABSTRACT
Four new species of Muricidae are described from the Philippines and the Caribbean area. The first two (*Homalocantha granpoderi* n. sp. and *H. ninae* n. sp.), from the Philippines, are compared with four closely related species: *H. scorpio* (Linnaeus, 1758), *H. pisori* d'Attilio & Kosuge, 1989, *H. vicdani* d'Attilio & Kosuge, 1989 and *H. dondani* d'Attilio & Kosuge, 1989. The need for comparisons based on an ontogenetic growth series is underlined for these species. For the first time, the growth series of each discussed species is illustrated. *Siratus pointieri* n. sp., from the Dominican Republic, is compared with three closely related species: *S. cailleti* (Petit de la Saussaye, 1856), *S. motacilla* (Gmelin, 1791) and *S. kugleri* (Clench & Pérez Farfante, 1945). *Murexsul* (*M.*) *jahami* n. sp., from Martinique, is compared with *M.* (*M.*) *sunderlandi* (Petuch, 1987), *M.* (*M.*) *oxytatus* (Smith, 1938), *M.* (*M.*) *zylmanae* (Petuch, 1993) and *M.* (*M.*) *chesleri* Houart, 2006. The characters of the spiral sculpture are described using precise structural homologies for each species.

KEY WORDS
Mollusca,
Gastropoda,
Muricidae,
Homalocantha,
Siratus,
Murexsul,
Philippines,
Caribbean,
new species.

RÉSUMÉ
Description de quatre nouvelles espèces de Muricidae (Mollusca, Gastropoda) des Philippines et des Caraïbes.
Quatre espèces nouvelles de Muricidae sont décrites des Philippines et des Caraïbes. Les deux premières (*Homalocantha granpoderi* n. sp. and *H. ninae* n. sp.), provenant des Philippines, sont comparées à quatre espèces proches :

MOTS CLÉS
Mollusca,
Gastropoda,
Muricidae,
Homalocantha,
Siratus,
Murexsul,
Philippines,
Caraïbes,
espèces nouvelles.

H. scorpio (Linnaeus, 1758), *H. pisori* d'Attilio & Kosuge, 1989, *H. vicdani* d'Attilio & Kosuge, 1989 et *H. dondani* d'Attilio & Kosuge, 1989. Pour ces espèces, la nécessité de comparaisons fondées sur une série ontogénétique de croissance est soulignée. Pour la première fois, les séries de croissance de chaque espèce discutée sont illustrées. *Siratus pointieri* n. sp., de la République Dominicaine, est comparé à trois espèces proches : *S. cailleti* (Petit de la Saussaye, 1856), *S. motacilla* (Gmelin, 1791) et *S. kugleri* (Clench & Pérez Farfante, 1945). *Murexsul* (*M.*) *jahami* n. sp., de Martinique, est comparé à *M.* (*M.*) *sunderlandi* (Petuch, 1987), *M.* (*M.*) *oxytatus* (Smith, 1938), *M.* (*M.*) *zylmanae* (Petuch, 1993) et *M.* (*M.*) *chesleri* Houart, 2006. Pour chaque espèce, les caractères de la sculpture spirale sont décrits à partir d'homologies structurales précises.

INTRODUCTION

New marine malacological research carried out in the Dominican Republic and the Lesser Antilles (Martinique) has led to the discovery of two new muricid species belonging to the genera *Siratus* Jousseaume, 1880 and *Murexsul* Iredale, 1915. These species will be presented in a book entitled "Guide to the malacological fauna of the Lesser Antilles" (Lamy & Pointier, in press). In addition, two new species of *Homalocantha* from the Philippine Islands are described here. Descriptions and comparisons are based on new material, especially juvenile specimens, allowing a better understanding of the ontogenetic growth of species closely related to *H. scorpio* (Linnaeus, 1758): *H. pisori* d'Attilio & Kosuge, 1989, *H. vicdani* d'Attilio & Kosuge, 1989 and *H. dondani* d'Attilio & Kosuge, 1989.

DESCRIPTIVE METHOD

Here, new species of three genera (*Homalocantha* Mörch, 1852, *Siratus* Jousseaume, 1880 and *Murexsul* Iredale, 1915) are described. The descriptive methodology used here follows that of Merle (1999, 2001, 2005) and Merle *et al.* (2011). The text conventions used to describe the spiral sculpture and the internal denticles of the apertural lip are given in the section Abbreviations. For *Homalocantha*, this method was used by Merle (2001) in order to show the sculptural pattern of two species (*H. melanamathos* (Gmelin, 1791) and *H. scorpio* (Linnaeus, 1758)). For *Siratus*, it was used by Houart (2000), Merle *et al.* (2001) and Merle & Garrigues (2008) for the analysis of the sculptural pattern of recent American species. For *Murexsul*, it has been used to describe the sculptural pattern of several species (Merle & Houart 2003; Houart 2004, 2006; Houart & Héros 2008).

ABBREVIATIONS

H height.

Terminology based on Merle (2001, 2005)

abis abapical infrasutural secondary cord;
ABP abapical siphonal primary cord;
abs abapical siphonal secondary cord;
adis adapical infrasutural secondary cord;
ADP adapical siphonal primary cord;
ads adapical siphonal secondary cord;
D1-D6 abapical apertural denticles;
EAB1 extreme abapical siphonal primary cord no. 1;
EAB2 extreme abapical siphonal primary cord no. 2;
ID infrasutural apertural denticle;
IP infrasutural primary cord;
MP median siphonal primary cord;
ms median siphonal secondary cord;
P primary cord (cord appearing in first order);
P1 shoulder cord;
P2-P6 primary cords of the convex part of the teleoconch whorl;
s secondary cord (cord appearing in second order);
s1-s6 secondary cords of the convex part of the

teleoconch whorl;
t tertiary cord (cord appearing in third order).

Repository
Coll. BG Bernard Garrigues collection (Castelmoron);
Coll. DL Dominique Lamy collection (Baie Mahault, Guadeloupe);
Coll. GG Gilles Granpoder collection (Saint Rémy de Provence);
Coll. JPP Jean-Pierre Pointier collection (Perpignan);
Coll. RD Régis Delannoye collection (Trinité, Martinique);
MNHN.IM. Muséum national d'Histoire naturelle (Sector: Recent molluscs), Paris, France.
CMNH Carnegie museum of Natural History, Pittsburg, Pennsylvania, USA.

SYSTEMATICS

Family MURICIDAE Rafinesque, 1815
Subfamily MURICOPSINAE
Radwin & d'Attilio, 1971

Genus *Homalocantha* Mörch, 1852

TYPE SPECIES. — *Murex scorpio* Linnaeus, 1758 by monotypy.

COMMENTS ON THE SUBFAMILIAL ASSIGMENT
The genus *Homalocantha* should be placed in *incertae sedis* in the subfamilies Muricopsinae and Muricinae (see Barco *et al.* 2010). We place here *Homalocantha* in the Muricopsinae as did Vokes (1994), but this placement is provisional, waiting for new phylogenetic data based on molecular studies.

COMMENTS ON THE SPECIES OF THE GROUP OF *H. SCORPIO* (LINNAEUS, 1758)
The two new species described here belong to a group of close species including *H. scorpio* (Linnaeus, 1758), *H. pisori* d'Attilio & Kosuge, 1989, *H. vicdani* d'Attilio & Kosuge, 1989 and *H. dondani* d'Attilio & Kosuge, 1989. Historically, *H. scorpio* was defined on the basis of adult specimens, but the three other species were defined only on the basis of juvenile specimens (d'Attilio & Kosuge 1989). Consequently, juveniles of *H. scorpio* were not represented or figured by d'Attilio & Kosuge (1989) and adults of the other three species have not been described. Since d'Attilio & Kosuge (1989), no worker was interested to document better the ontogeny of these species. The opportunity to study new material allows relating juveniles to adults and then to understand and define these species better from a growth series. Thus, it is the first time that a growth series is presented for these species (Figs 1-6). Our observations are based on 225 specimens of *H. scorpio*, 32 specimens of *H. pisori*, 25 specimens of *H. vicdani*, 4 specimens of *H. dondani*, 5 specimens of *H. granpoderi* n. sp. and 29 specimens of *H. ninae* n. sp. Considering only adults morphologies, morphological differences could be interpreted as intraspecific variations, but young morphologies appear poorly variable and more differentiated than adults. For example, juveniles of *H. scorpio* (e.g., Fig. 3A) display few variations regarding their cords, their shape and their colour and differ clearly from the juveniles of *H. granpoderi* n. sp. (Fig. 1). So, our experience based on numerous specimens suggests that, for this group of *Homalocantha*, young morphologies characterize species better than the adult morphologies do. On the evolutionary point of view, ontogenic changes affecting younger morphologies than adult morphologies correspond to a heterochronic process called early innovations (Dommergues *et al.* 1986; Videt & Néraudeau 2003). On the other hand, the Philippines hotspot is identified as one of the world's biologically richest areas and it is not surprising to find several muricid species of the same genus in this area. In comparison to the Philippines archipelago, the São Tomé and Principe Islands (West Africa), a smaller area with a lower species richness, contains no more than six species of *Muricopsis* (Rolán & Fernandes 1991; Houart 1996, 2005; Rolán & Gori 2007; Houart & Gori, 2008): *M. rutilus mariangelae* Rolán & Fernandes, 1991, *M. matildae* Rolán & Fernandes, 1991, *M. principensis* Rolán & Fernandes, 1991, *M. delemarrei* Houart, 2005, *M. hernandezi* Rolán & Gori, 2007 and *M.* (*s.s.*) *testorii* Houart & Gori, 2008.

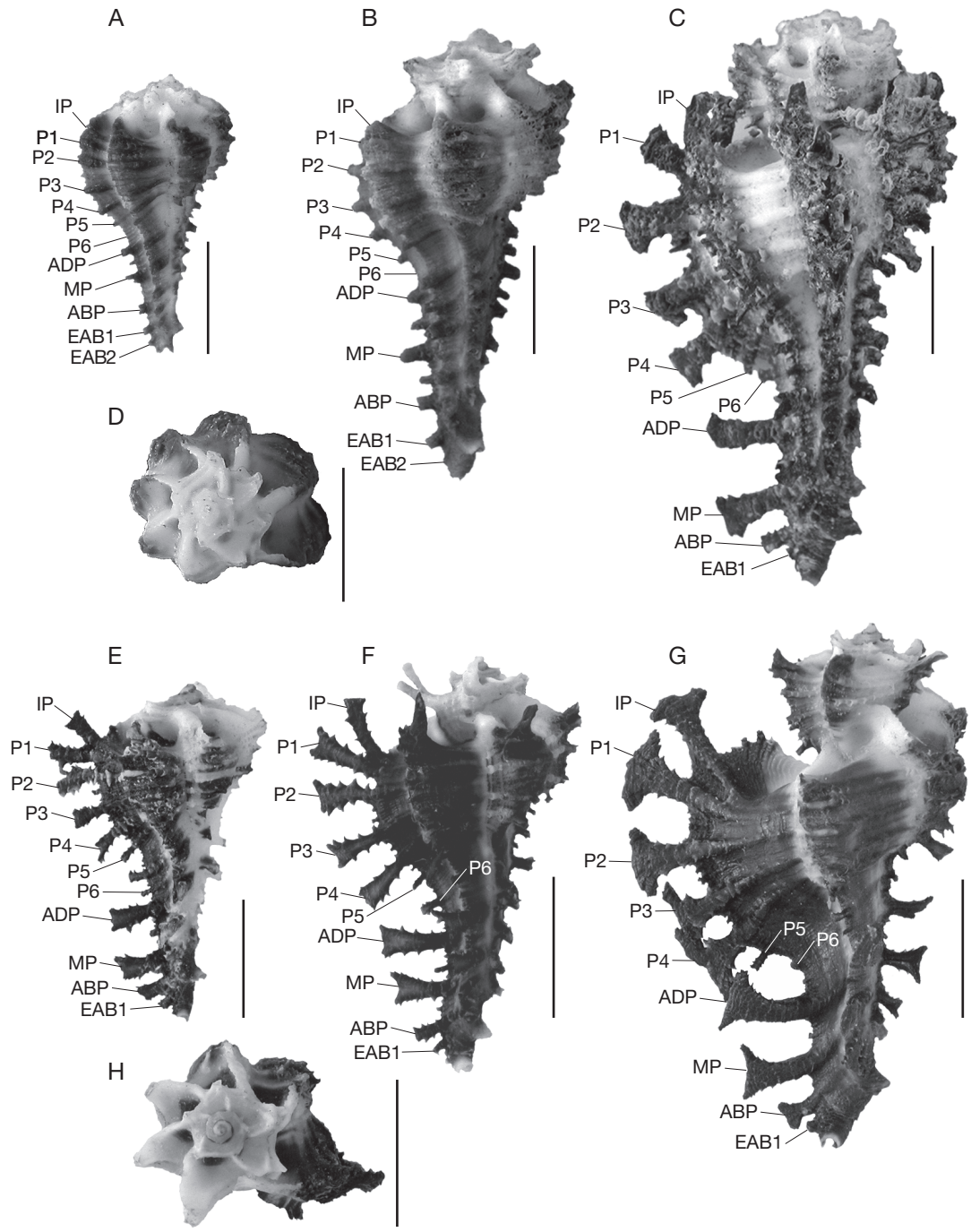

FIG. 1. — *Homalocantha granpoderi* n. sp. and *H. ninae* n. sp., primary cords in dorsal and apical views: **A**-**D**, *H. granpoderi* n. sp.; **A**, paratype MNHN.IM.24627 (H: 24 mm); **B**, Coll. GG, Palawan, Philippines (H: 39.9 mm); **C**, holotype MNHN.IM.24626 (H: 47 mm); **D**, paratype (apical view); **E**-**H**, *H. ninae* n. sp.; **E**, syntype 1 MNHN.IM.24628 (H: 25 mm); **F**, Coll. BG, Balicasag Island, Philippines (H: 26.6 mm); **G**, syntype 2 (H: 37.8 mm); **H**, syntype 1 MNHN.IM.24629 (apical view). Scale bars: 10 mm.

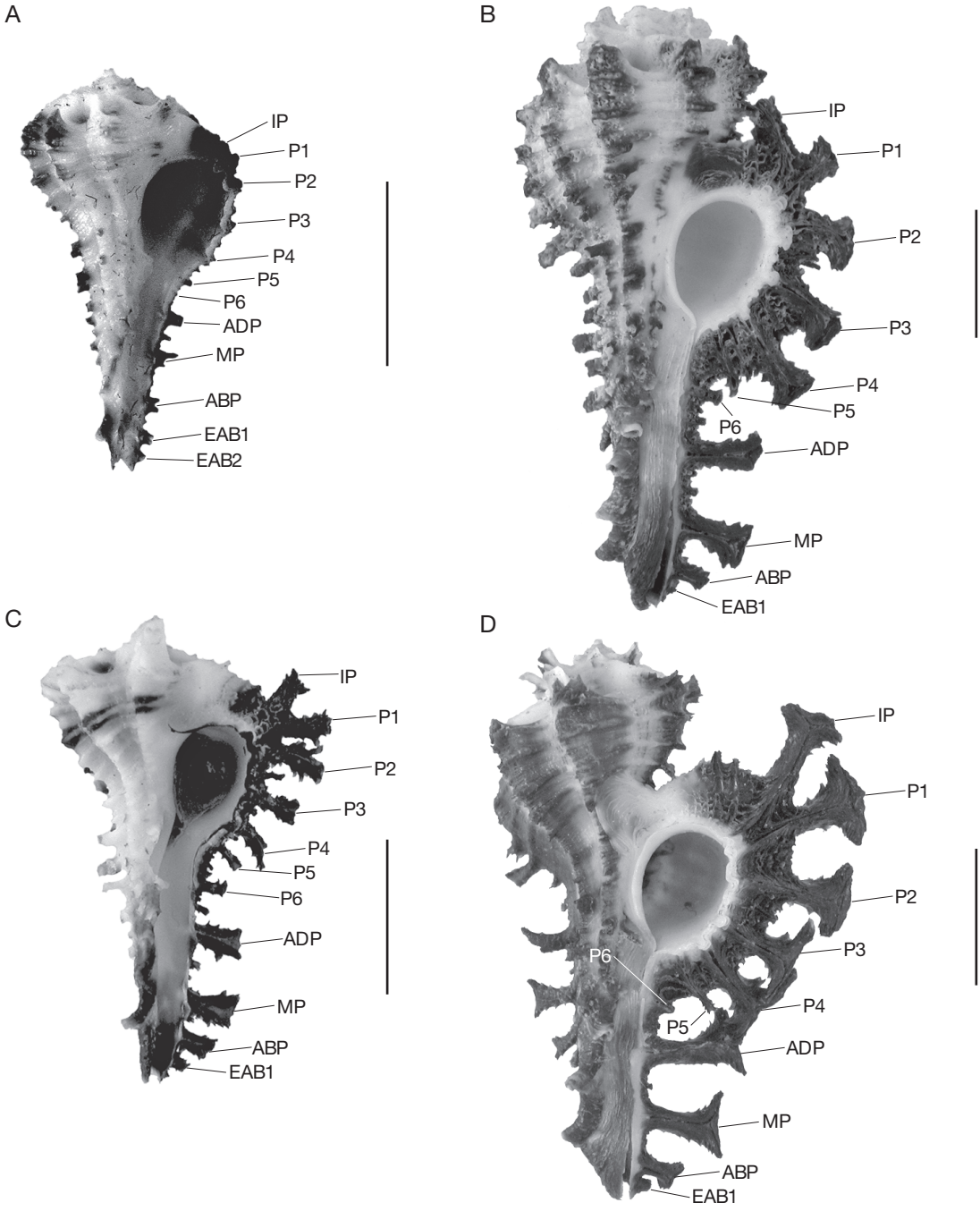

FIG. 2. — *Homalocantha granpoderi* n. sp. and *H. ninae* n. sp., primary cords in ventral view: **A**, **B**, *H. granpoderi* n. sp.; **A**, paratype MNHN.IM.24627 (H: 24 mm); **B**, holotype MNHN.IM.24626 (H: 39.9 mm); **C**, **D**, *H. ninae* n. sp.; **C**, syntype no. 1 MNHN.IM.24628 (H: 25 mm); **D**, syntype no. 2 MNHN.IM.24629 (H: 37.8 mm). Scale bars: 10 mm.

Homalocantha granpoderi n. sp.
(Figs 1A-D; 2B)

TYPE MATERIAL. — **Philippines**. Mactan Island, 150 m deep, holotype (MNHN.IM. 24626) (H: 47 mm). — Mindanao, Balut Island, 150-200 m deep, 1 paratype (MNHN.IM. 24627) (H: 24 mm).

TYPE LOCALITY. — **Philippines**. Mactan Island, 150 m deep.

OTHER MATERIAL EXAMINED. — **Philippines**. Balut Island, 1 specimen (Coll. BG) (H: 28 mm). — Palawan, 1 specimen (Coll. GG) (H: 39.9 mm).

ETYMOLOGY. — Named in honour to Gilles Granpoder.

DESCRIPTION OF HOLOTYPE

Protoconch paucispiral, broken. Teleoconch of four whorls, club-shaped, 47 mm high, 27 mm wide. Spire low, shouldered, of three whorls. Suture impressed, but region surrounding suture deeply excavated. Last whorl narrow, fusiform. Last whorl adherent to spire, 78% of teleoconch height. Apical angle 90° (excluding spines), 110° (including spines). Spiral sculpture with marked primary cords of flat ribbon shape, with surface scabrous. First and second whorls: cords IP and P1 spiny; spines on IP and P1 almost welded, squared distally; third whorl: P2, P3 and P4 (none spiny) visible on each whorl; last (fourth) whorl: spines of cords IP and P1 almost welded proximally; P2, P3, P4 with spines developed, of the same length on each cord; P5 spine atrophied, situated on base of convex part of whorl; P6 spine atrophied, situated on top of siphonal canal; ADP and MP spines developed, of same length as P3 and P4; ABP spine shorter than MP and EAB1 spines shorter than ABP. Longest cord spines distally palmate. Secondary cords s2, s3, s4, s5, s6, ads, ms and abs present. Tertiary cords present. Axial sculpture of 6 varices on first whorl, 7 varices on second whorl, 8 varices on third and fourth whorls. Terminal variceal expansion on convex part of whorl produces webbed shape of last varix. Intervariceal spaces concave on two earliest teleoconch whorls, convex on other whorls. Aperture oval, 23% of diameter (including spines), 69% of shell height. Columellar lip smooth, adherent. No anal sulcus. Outer lip finely crenulate and lirate within. Siphonal canal inclined to right, 50% of shell height. First and second whorls white, other whorls with varices dark brown and intervarices whitish. Operculum and radula unknown.

GROWTH SERIES

The studied material includes four specimens from a juvenile, 24 mm in height (paratype), to the adult holotype, 47 mm in height. The juvenile has a club-shaped teleoconch and very rounded varices. Its spiral sculpture has very poorly developed spines on the convex part of the whorl and short spines on the siphonal canal. Two other specimens of intermediate height (height 28 and 39.9 mm) have rounded varices, weak development of cord spines (especially on the convex part of the whorl) and a club-shaped teleoconch. They bear EAB2, which is missing on the holotype. The holotype shows a sculptural change on the last half of the last whorl. Here the cord spines on the convex part of the whorl become more and more developed. The shape of the varices also changes and becomes concave instead of convex as on the preceding whorl. The overall shape of the teleoconch does not vary, but remains club-shaped.

INTERSPECIFIC COMPARISONS

Homalocantha granpoderi n. sp. needs to be compared to *H. scorpio*, which is the most closely similar species. Juvenile specimens of *H. scorpio* (Figs 3A; 4A) differ by their angulate last whorl, by their concave intervariceal spaces, by having IP and P1 cord spines developed and quickly later by developing P3 and P4 cord spines, and by the brown colour of the distal part of the varices. Adult specimens of *H. scorpio* (Figs 3B, C; 4B) are distinguished by a wider last whorl, and by a higher and more disjunct spire. Long cord spines (IP, P1, P2, P3, P4, MP and ABP) occur quickly on the last whorl in *H. scorpio*, while they remain shorter in *H. granpoderi* n. sp.

Homalocantha ninae n. sp.
(Figs 1E-H; 2C, D)

TYPE MATERIAL. — **Philippines**.Cebu, Olango Island, 10-20 m deep, syntype 1 (MNHN.IM.24628) (H: 25 mm). — Cebu, Calituban Island, syntype 2 (MNHN.IM.24629) (H 37.8 mm).

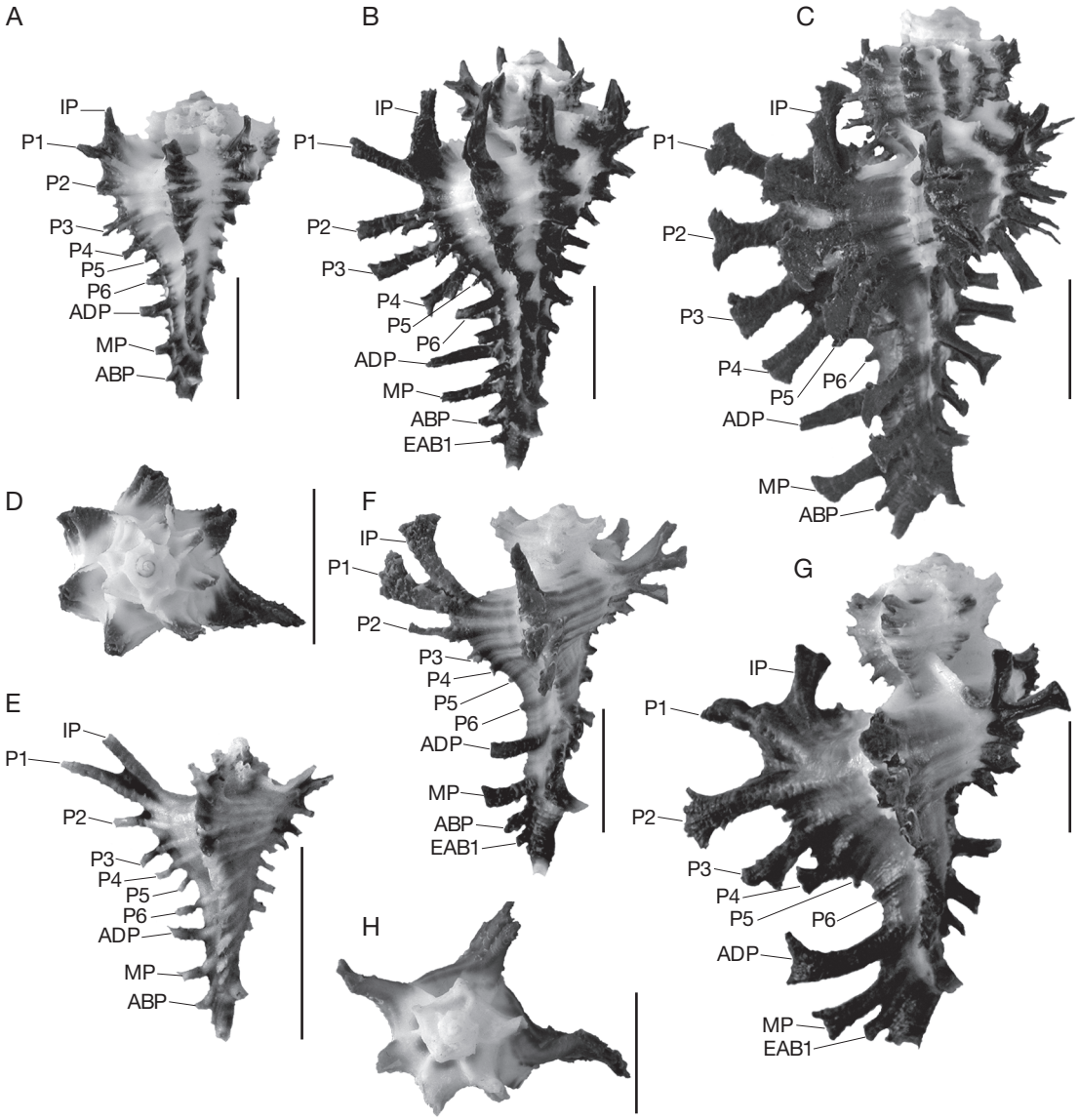

FIG. 3. — *Homalocantha scorpio* (Linnaeus, 1758) and *H. pisori* d'Attilio & Kosuge, 1989, primary cords in dorsal and apical views: **A**-**D**, *H. scorpio*; **A**, Coll. BG, 10 m, Bantayan Island, Cebu, Philippines (H: 24.7 mm); **B**, Coll. BG, 10 m, Calituban, Bohol, Philippines (H: 36.8 mm); **C**, Coll. BG, Calituban, Philippines (H: 51.6 mm); **D**, Coll. BG, Balut Island, Mindanao, Philippines (H: 28 mm) (apical view); **E**-**H**, *H. pisori*; **E**, Coll. BG, Philippines (H: 14 mm); **F**, **H** (apical view), Coll. BG, Davao at 80-120 m deep, Philippines (H: 29 mm); **G**, Coll. BG, Bohol at 20 m deep, Philippines (H: 40 mm). Scale bars: 10 mm.

TYPE LOCALITY. — **Philippines**. Cebu, Olango Island, 10-20 m deep.

OTHER MATERIAL EXAMINED. — **Philippines**. Cebu, Olango Island, 12-30 m deep, 2 specimens (Coll. BG). — Balicasag Island, 6 specimens (Coll. BG). — Calituban Island, 2 specimen (1 Coll. BG and 1 Coll. GG). — Mactan Island, 9-12 m deep, 3 specimens (Coll. BG). — Samal Island, Punta Pait, 20-60 m deep, 2 specimens (Coll. BG). — Samar Sea, Baliran Island,

1 specimen (Coll. BG). — Davao Island, 2 specimens (Coll. GG).

ETYMOLOGY. — Named in honour of Nina Merle.

COMMENTS. — As this species is best defined by its growth series, we prefer to designate two syntypes, in respect of ICZN (ICZN 1999: Article 72.3, rather than a holotype. The type series includes an intermediate-sized juvenile (syntype 1) and an adult specimen (syntype 2). ICZN Article 72.3 states: "Name-bearing types must be fixed originally for nominal species-group taxa established after 1999. A proposal of a new nominal species-group taxon after 1999 (unless denoted by a new replacement name (*nomen novum*) [Arts. 16.4, 72.7]), must include the fixation of a holotype [Art. 16.4] (see Article 73.1) or syntypes [Art. 73.2]. In the case of syntypes, only those specimens expressly indicated by the author to be those upon which the new taxon was based are fixed as syntypes".

DESCRIPTION OF SYNTYPE MNHN.IM.24628 (JUVENILE)

Protoconch broken.

Teleoconch of three whorls, 25.1 mm high, 16.5 mm wide. Spire very low, of two whorls, earliest teleoconch whorl flat, penultimate whorl inflated. Last whorl 94.2% of shell height. Apical angle 120° excluding spines, 135° including spines. Spiral sculpture of rounded primary cords. Primary cord spines with scabrous sculpture. On penultimate whorl, IP and P1 spines welded. On last whorl, IP and P1 spines well-developed, slightly deviated, P2, P3 and P4 spines well-developed, P5 and P6 spines smaller than P4 spine; P6 situated on base of siphonal canal, but not atrophied; ADP and MP spines developed, ABP spine smaller than MP spine, EAB1 spine smaller than ABP spine. Longest cord spines (on IP, P1, P2, ADP and MP) distally palmate. Secondary cords s2, s3, s4, s5, s6, ads and ms present. Tertiary cords present. Six varices present from the first to the last (third) whorl. Varices concave on two earliest whorls, convex on third whorl. Aperture oval, 24.2% of diameter (including spines), 79.7% of total height. Columellar lip smooth, slightly adherent. No anal sulcus. Siphonal canal inclined to right, 55.8% of total height. Two earliest whorls white; last whorl: at first, appearance of a dark brown band on P3; later, all primary cords dark brown, except IP; finally, appearance of convex, dark brown varices, intervariceal space dark brown.

DESCRIPTION OF SYNTYPE MNHN.IM.24629 (ADULT)

Protoconch of two convex whorls. Teleoconch of four whorls, fusiform, 37.8 mm high, 25.7 mm wide. Spire of three whorls, earliest two whorls flat, penultimate whorl high, constricted at base and disjunct from last whorl, overall funnel-shaped. Last whorl 74% of teleoconch height. Apical angle 110° (excluding spines), 135° (including spines). Spiral sculpture of rounded primary cords. IP and P1 spines fused on two earliest teleoconch whorls. On penultimate whorl, IP and P1 spines reduced; on last whorl, IP and P1 spines poorly developed on varices, except well-developed on terminal varix. On terminal varix, IP, P1, P2, P3 and P4 spines well-developed, P5 and P6 spines atrophied, P5 spines shorter than P6, P6 situated on base of siphonal canal; ADP and MP spines well-developed, ABP spine shorter than MP spine, EAB1 spine shorter than ABP spine. Longest cord spines (on P1, P2, P3, P4, ADP and MP) distally palmate, each with two small digitations. Five varices present from first to last whorl. Varices on two last whorls convex. Terminal variceal expansion (outer lip) on convex part of whorl producing webbed shape to last varix. Aperture oval, 21% of diameter (including spines), 68% of shell height. Columellar lip smooth, slightly adherent. No anal sulcus. Outer lip finely crenulate and lirate within. Siphonal canal inclined to right, 47% of total height. On penultimate whorl, varices dark brown, intervarices whitish; on last whorl, varices and distal part of intervarices dark brown, proximal part of intervarices whitish. Operculum subcircular; nucleus lateral, to right of centre.

INTERSPECIFIC COMPARISONS

Homalocantha ninae n. sp. may be compared to *H. scorpio* (Figs 3A-D; 4A, B), *H. pisori* (Figs 3E-H; 4C, D), *H. vicdani* (Figs 5A-D; 6A, B) and *H. dondani* (Figs 5E-H; 6C, D).

Homalocantha scorpio *versus* H. ninae *n. sp.*

Juvenile specimens of *H. scorpio* differ from those of *H. ninae* n. sp. by their concave intervariceal

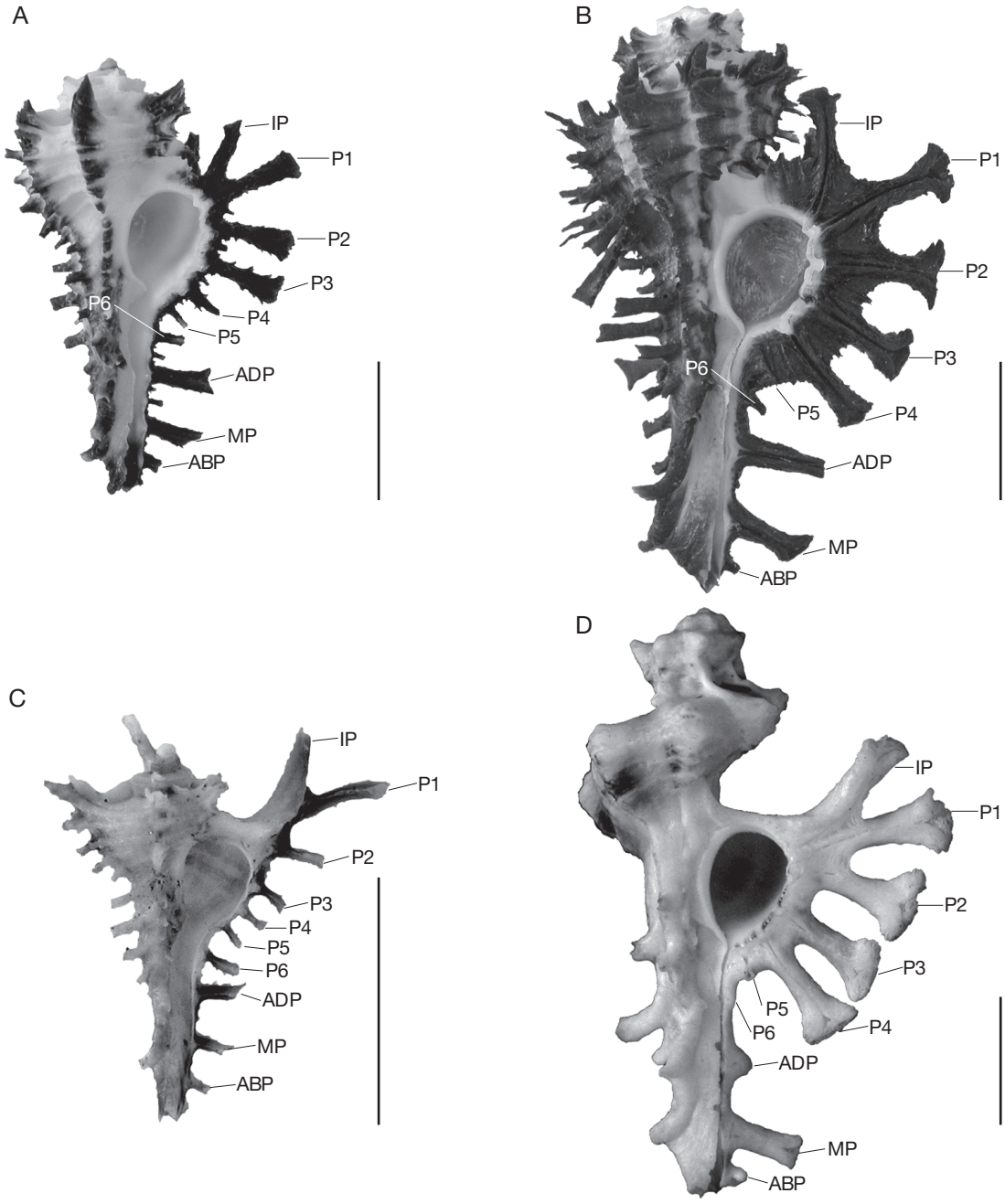

FIG. 4. — *Homalocantha scorpio* (Linnaeus, 1758) and *H. pisori* d'Attilio & Kosuge, 1989, primary cords in ventral view: **A**, **B**, *H. scorpio*; **A**, Coll. BG, Balut Island, Mindanao, Philippines (H: 29 mm); **B**, Coll. BG, Calituban, Philippines (H: 51.6 mm); **C**, **D**, *H. pisori*; **C**, Coll. BG, Bantayan Island, Cebu, Philippines (H: 24.7 mm); **D**, Coll. BG, Mactan Island, Philippines (H: 44.2 mm). Scale bars: 10 mm.

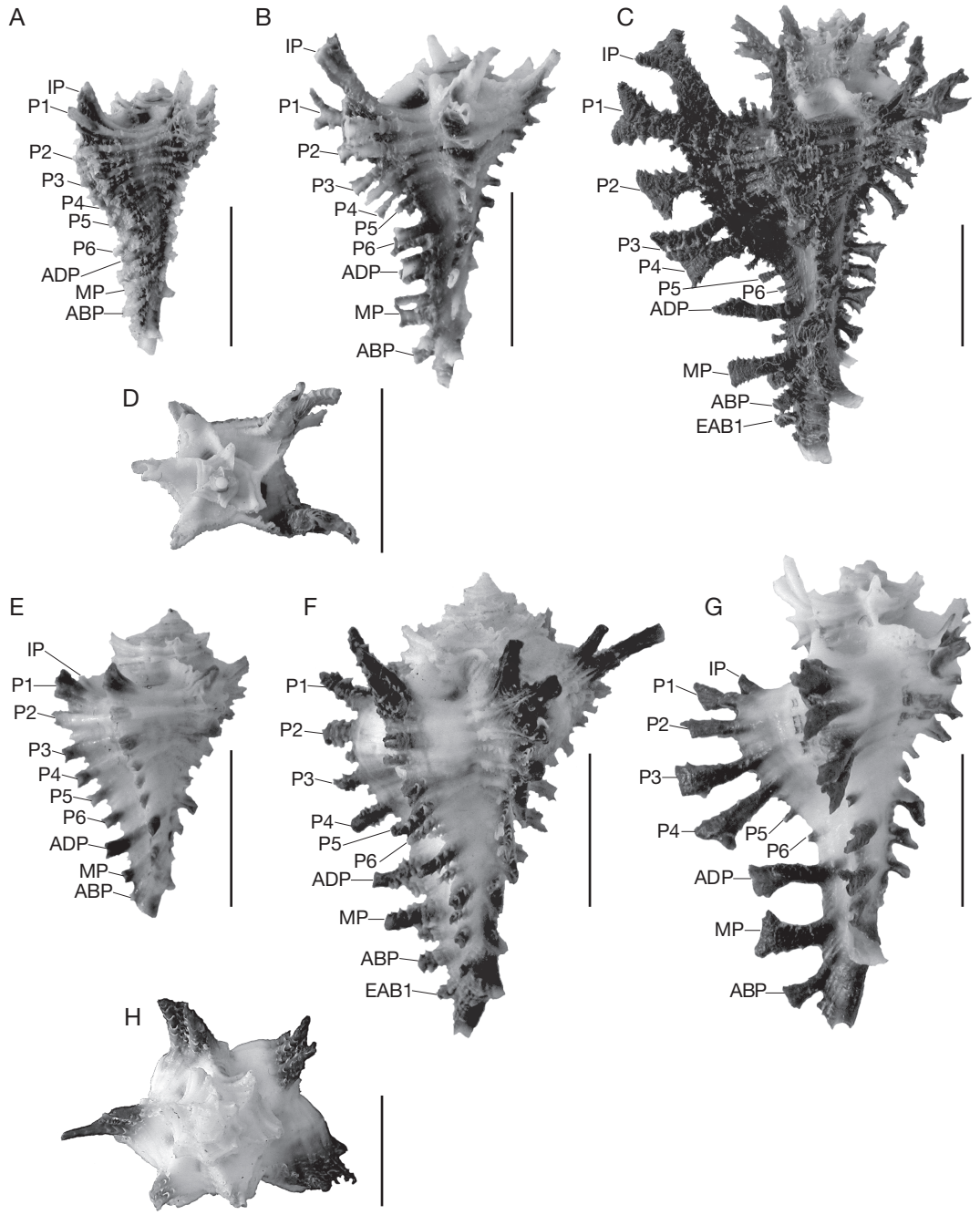

Fig. 5. — *Homalocantha vicdani* d'Attilio & Kosuge, 1989 and *H. dondani* d'Attilio & Kosuge, 1989, primary cords in dorsal and apical views: **A**-**D**, *H. vicdani*; **A**, Coll. BG, Camiguin, at 30 m deep, Mindanao, Philippines (H: 20 mm); **B**, **D** (apical view), Coll. BG, Mactan Island at 12 m deep, Philippines (H: 23 mm); **C**, Coll. BG, Calituban Island, Philippines (H: 36.2 mm); **E**-**H**, *H. dondani*; **E**, Coll. BG, Philippines (H: 19.3 mm); **F**, **H**, apical view, Coll. BG, Philippines (H: 31.7 mm); **G**, Coll. BG, Calituban Island at 20 m deep, Bohol (H: 30 mm). Scale bars: 10 mm.

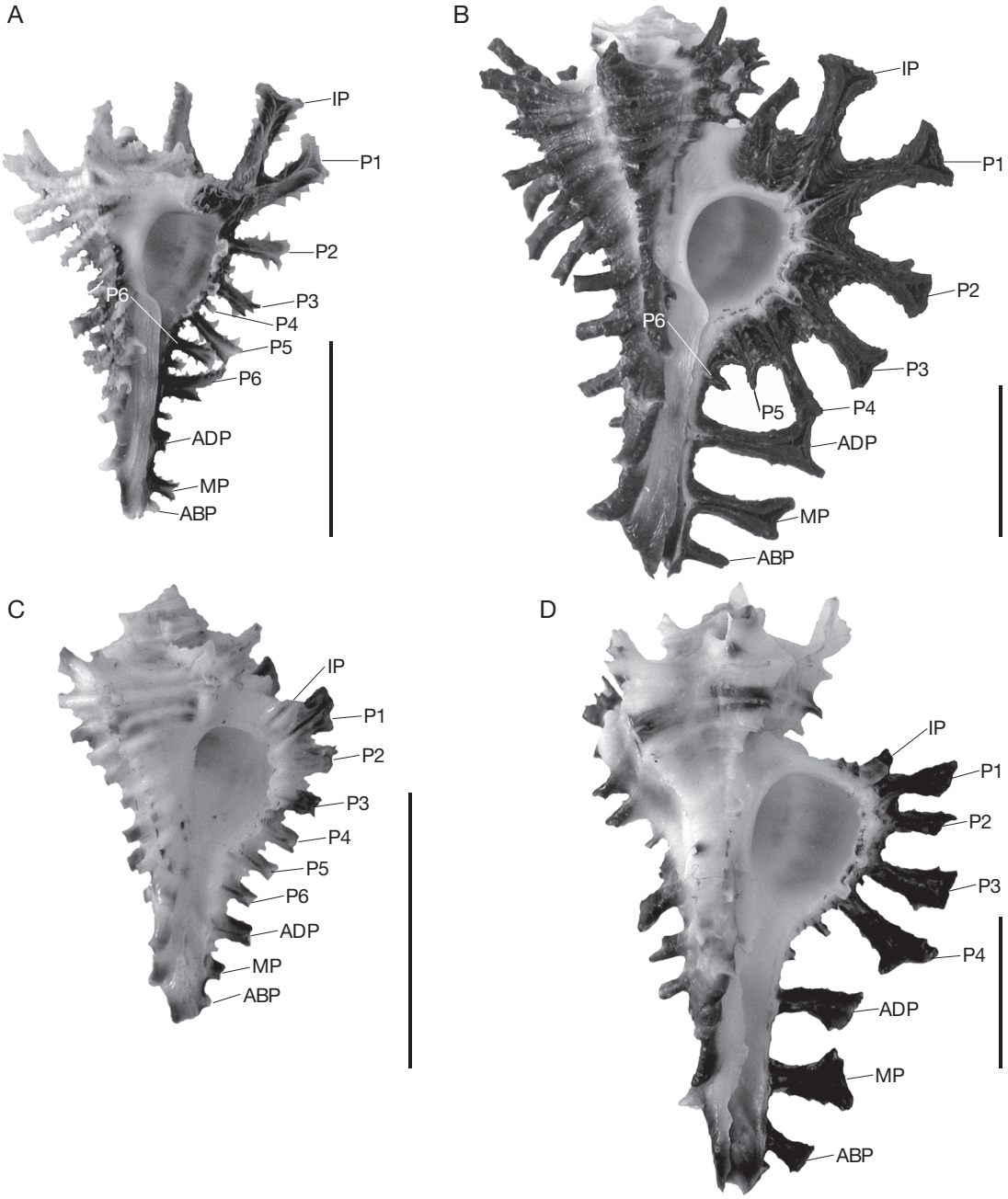

FIG. 6. — *Homalocantha vicdani* d'Attilio & Kosuge, 1989 and *H. dondani* d'Attilio & Kosuge, 1989, primary cords in ventral view: **A**, **B**, *H. vicdani*; **A**, Coll. BG, 120 m, Mactan Island, Philippines (H: 22.6 mm); **B**, Coll. BG, Palawan Island, Philippines (H: 36.5 mm); **C**, **D**, *H. dondani*; **C**, Coll. BG, Philippines (H: 19.3 mm); **D**, Coll. BG, Calituban Island at 20 m deep, Bohol (H: 30 mm). Scale bars: 10 mm.

spaces, by their higher spire and by the dark brown colour present only on the varices, the wide intervariceal spaces being white. Adult specimens of *H. scorpio* have concave intervariceal spaces, instead of convex ones in *H. ninae* n. sp., and have cord spines developed on the varices of the last whorl, whereas they are short and poorly developed in *H. ninae* n. sp. The terminal varix is similar in both species. The number of varices on juveniles is six in *H. ninae* n. sp. (two specimens) and varies from six to eight in *H. scorpio* (13 specimens). The number of varices on adults is five in *H. ninae* n. sp. (two specimens) and varies from six to seven in *H. scorpio* (14 specimens).

Homalocantha pisori *versus* H. ninae *n. sp.*
Juvenile specimens of *H. pisori* differ from those of *H. ninae* n. sp. by their concave intervariceal spaces. On the third whorl, the primary cord spines IP and P1 are hypertrophied, welded and just separated by an acute angle in *H. pisori*, while IP and P1 spines are not hypertrophied in *H. ninae* n. sp. On the fourth whorl, IP, P1 and P2 are welded proximally in *H. pisori*, while P2 is not welded proximally to IP and P1 in *H. ninae* n. sp. The last whorl of adults of *H. pisori* bears flat intervariceal spaces and has cord spines developed, whereas that of *H. ninae* n. sp. has convex varices and reduced spines. From the juvenile to the adult, the shells of *H. pisori* differ by their pale tan colour. The terminal varix of *H. pisori* resembles that of *H. ninae* n. sp., but IP, P1 and P2 are better developed in *H. pisori*, whereas IP to P4 are all similarly developed in *H. ninae* n. sp.

Homalocantha vicdani *versus* H. ninae *n. sp.*
Juvenile specimens of *H. vicdani* differ from those of *H. ninae* n. sp. by their concave intervariceal spaces. On the third whorl, primary cord spines on IP and P1 are hypertrophied and welded in *H. vicdani* and a scabrous microsculpture appears in this species, whereas it is lacking in *H. ninae* n. sp. The last whorl of adults of *H. vicdani* has a shouldered form, with concave intervariceal spaces and with cord spines developed, whereas that of *H. ninae* n. sp. has a rounded form, convex varices and reduced spines. *H. vicdani* differs further in its ochre colour. The terminal varix is similar in both species.

Homalocantha dondani *versus* H. ninae *n. sp.*
Juvenile specimens of *H. dondani* differ from those of *H. ninae* n. sp. by their concave intervariceal spaces, shouldered whorls and higher spire. The last whorl of adults of *H. dondani* has small intervariceal nodules, which are missing in *H. ninae* n. sp. As in *H. scorpio*, *H. pisori*, and *H. vicdani*, the varices of the last whorl of *H. dondani* have cord spines developed. From the juvenile to the adult, the shell colour of *H. dondani* is creamy white with pale rusty varices. The terminal varix is similar in both species.

Genus *Murexsul* Iredale, 1915

TYPE SPECIES. — *Murex octogonus* Quoy & Gaimard, 1833 by original designation.

Subgenus *Murexsul* Iredale, 1915

***Murexsul* (*Murexsul*) *jahami* n. sp.**
(Fig. 7A, B)

Muricidae sp. – Pointier & Lamy 1998: 104.

TYPE MATERIAL. — **Martinique**. 250 m deep, holotype (MNHN.IM.24630) (H: 26 mm) and 1 paratype (Coll. DL) (H: 25 mm).

TYPE LOCALITY. — **Martinique**. Eastern Martinique, Peninsula Caravelle.

ETYMOLOGY. — Named in honour of Patrice de Jaham.

DESCRIPTION OF HOLOTYPE
Protoconch unknown. Teleoconch biconic, of seven whorls, 26 mm high, 21.8 mm wide (including spines). Last (seventh) whorl 62% of total height. Spire tall, apical angle 54° (excluding spines), 118° (including spines). Spiral sculpture of marked primary cords. First whorl not seen. Second whorl: P1, P2 and P3 present. Third whorl: no change. Fourth whorl: appearance of primary cord IP (on sutural ramp), secondary cords adis and abis (on sutural ramp), s1 and s2. Fifth whorl: P2 atrophied. Sixth whorl: P2

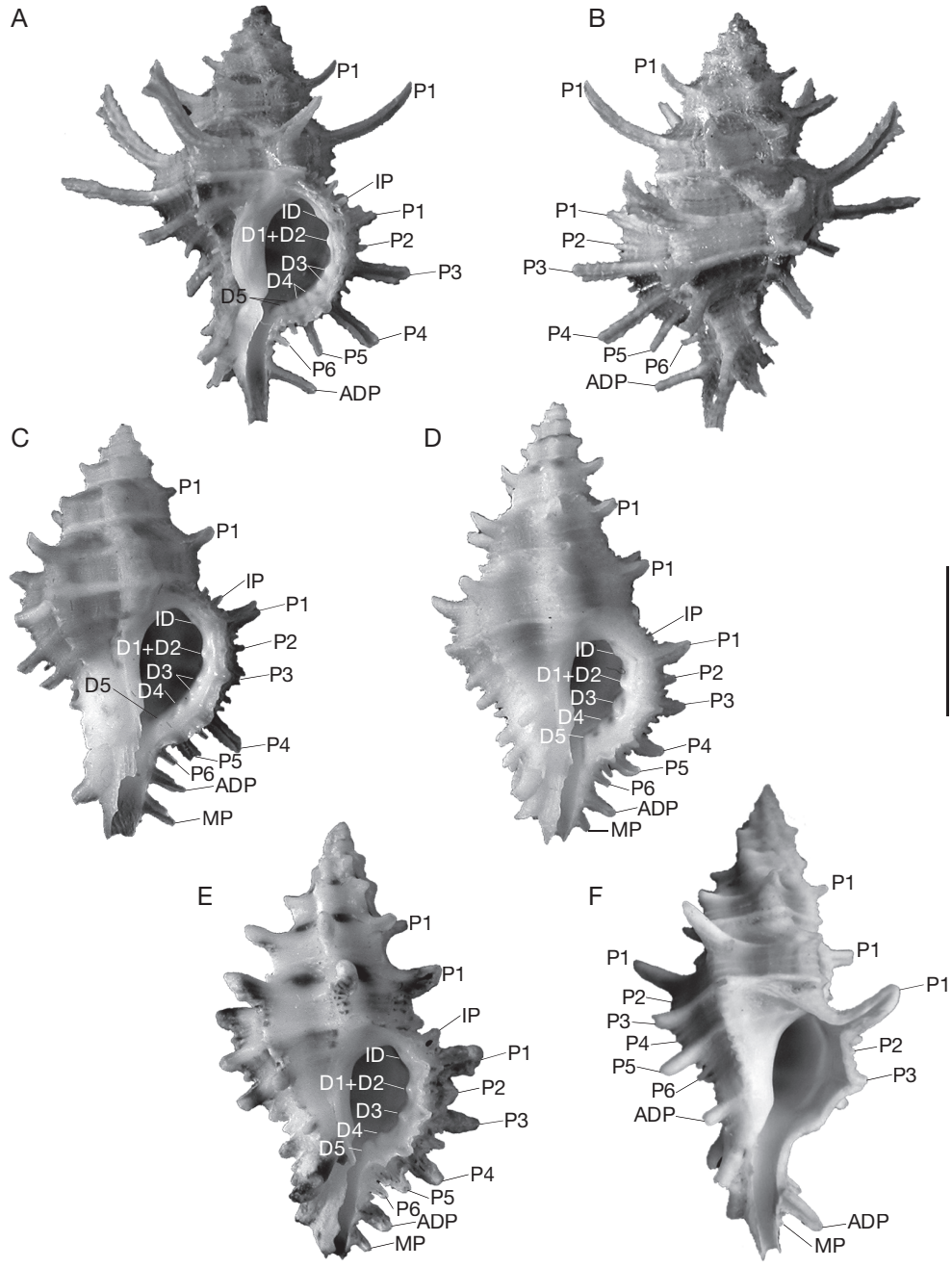

Fig. 7. — Primary cords and internal denticles of the outer lip of *Murexsul* (*s.s.*) *jahami* n. sp., *M.* (*s.s.*) *sunderlandi* (Petuch, 1987), *M.* (*s.s.*) *oxytatus* (Smith, 1938), *M.* (*s.s.*) *chesleri* Houart, 2006 and *M.* (*s.s.*) *zylmanae* (Petuch, 1993): **A**, **B**, ventral and dorsal views, *M.* (*s.s.*) *jahami* n. sp., holotype MNHN.IM.24630 (H: 26 mm); **C**, *M.* (*s.s.*) *sunderlandi*, Coll. BG, Bahamas (H: 18.40 mm); **D**, *M.* (*s.s.*) *oxytatus*, Coll. BG, Rosalind Bank, Honduras (H: 21.6 mm); **E**, *M.* (*s.s.*) *chesleri*, Coll. BG, Roatan Island, at 5 m deep, Honduras (H: 21.4 mm); **F**, *M.* (*s.s.*) *zylmanae*, holotype, Great Isaacs Cay, Bahamas (H: 31 mm), photo courtesy of Megan Paustian (CMNH). Scale bar: 10 mm.

atrophied further. Seventh whorl: adis, IP and abis (on infrasutural ramp), P1 to P5, s1 to s5 (on convex part of whorl), and P6 and ADP present (on siphonal canal). P1, P3 and P4 and ADP cord spines hypertrophied, P5 spine slightly atrophied, P2 and P6 spines more atrophied. Longest spines (P1) distally bifid. First and second whorls with seven varices each. Six varices present on each of third to penultimate whorls. Last whorl with five varices. Microsculpture finely scabrous due to slightly erected growing lamellae. Aperture oval, 27.5% of diameter (including spines), 59.6% of shell height. Columellar lip smooth, erect, adherent only adapically. No anal sulcus. Outer lip finely crenulate, denticles varying in prominence: ID and D1+D2 (fused denticles); D3 to D5 split. Siphonal canal 30.8% of shell height, narrowly open, weakly recurved dorsally. Pseudumbilicus narrow. Colour pale tan with a darker spiral band between P3 and P4.

Interspecific comparisons

Murexsul jahami n. sp. belongs to the American members of the group of *Murexsul* (*M.*) *oxytatus* (Smith, 1938) defined by Merle & Houart (2003) and discussed later by Houart (2006). Some of them have been placed previously in *Muricopsis* Bucquoy & Dautzenberg, 1882 by Vokes (1994). In this group, species with spiny patterns bear strongly developed P1, P3, P4 and ABP spines, poorly developed P5 spines, atrophied P2 spine, and the P6 spine generally missing. In this group, *M.* (*M.*) *jahami* n. sp. can be compared with *M.* (*M.*) *oxytatus* (Fig. 7D), *M.* (*M.*) *zylmanae* (Petuch, 1993) (Fig. 7F), *M.* (*M.*) *chesleri* Houart, 2006 (Fig. 7E) and *M.* (*M.*) *sunderlandi* (Petuch, 1987) (Fig. 7C.). *Murexsul* (*M.*) *oxytatus*, *M.* (*M.*) *zylmanae* and *M. (M.) chesleri* are three very closely similar species. They are easily distinguishable from *M.* (*M.*) *jahami* n. sp. by their higher spire, their less inflated last whorl, and their narrower aperture. The inner lip can be ornamented by one or two columellar tubercles in some specimens of *M.* (*M.*) *oxytatus* and *M.* (*M.*) *chesleri*, whereas it is smooth in *M.* (*M.*) *jahami* n. sp. *Murexsul* (*M.*) *sunderlandi* from the Bahamas resembles *M.* (*M.*) *jahami* n. sp. more closely in sharing an inflated last whorl. Nevertheless, the surface of *M.* (*M.*) *jahami* n. sp. is very scabrous, whereas it is almost smooth in *M.* (*M.*) *sunderlandi*. Considering the primary cord spines, P1, P3, P4 and ADP are strongly hypertrophied and the distal part of these spines is weakly open in *M.* (*M.*) *jahami* n. sp., while they are not so well-developed in *M.* (*M.*) *sunderlandi*. Moreover, spine MP is present in *M.* (*s.s.*) *sunderlandi*, whereas it is missing in *M.* (*M.*) *jahami* n. sp. In the aperture, the columellar lip is adherent in *M.* (*M.*) *sunderlandi*, whereas it is erected in *M.* (*M.*) *jahami* n. sp.

Subfamily Muricinae Rafinesque, 1815

Genus *Siratus* Jousseaume, 1880

Type species. — *Purpura sirat* Jousseaume, 1880 by original designation (junior synonym of *Murex senegalensis* Gmelin, 1791).

Siratus pointieri n. sp.
(Figs 8A, B; 10A)

Type material. — Holotype (MNHN.IM.24631); 3 paratypes (Coll. BG).

Type locality. — **Dominican Republic**. Las Salinas, on coarse sandy bottom, 230-245 m deep.

Other material examined. — **Dominican Republic**. Las Salinas, 1 specimen (Coll. JPP).
Martinique. 250 m deep, 1 specimen (Coll. RD).

Etymology. — Named in honour of Jean-Pierre Pointier.

Description of holotype

Protoconch paucispiral, of 2.0 whorls, 1.0 mm in diameter, surface ornamented with granules. Teleoconch globular, 57.7 mm high, 28.9 mm wide. Spire moderately elongate, of 6.75 whorls. Last (7th) whorl 78.2% of teleoconch height. Apical angle 63.5°. Spiral sculpture of well-marked primary cords on early teleoconch whorls; fine, poorly defined primary cords on later whorls. First and second whorl: appearance of IP, P1, P2 and P3; third whorl: appearance of adis; fourth whorl:

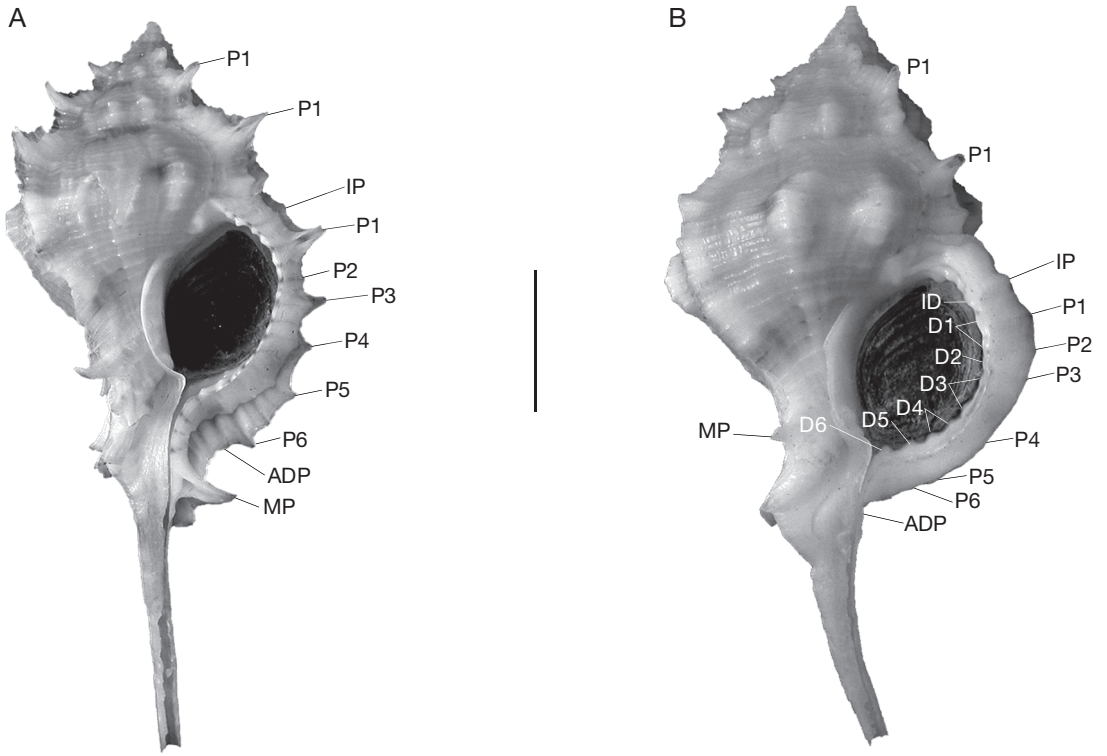

Fig. 8. — Primary cords and internal denticles of the outer lip of *Siratus pointieri* n. sp.: **A**, paratype (juvenile), Coll. BG, Las Salinas, Dominican Republic (H: 53.4 mm); **B**, holotype (adult) MNHN.IM.24631, Las Salinas, Dominican Republic (H: 57.7 mm). Scale bar: 10 mm.

appearance of abis and s1; fifth whorl: appearance of s2; sixth whorl: appearance of s3 and P4; seventh (last) whorl: IP, adis and abis on infrasutural ramp, P1 to P6, s1 to s6 on convex part of whorl, ADP and MP poorly developed on siphonal canal. P1, P2, P3, s3, P4, s4, P5, s5, P6, s6 poorly developed and equivalent. Numerous fine threads on last whorls. Axial sculpture of 11 protovarices (axial ridges occurring before distinction between true varices and intervariceal ribs) on first whorl. On second whorl: 10 protovarices. On third whorl: appearance of three major varices and six intervariceal ribs (two to three between each pair of varices). On fourth whorl: nine intervariceal ribs (three between each pair of varices). On sixth whorl: six intervariceal ribs (two between each pair of varices). On seventh whorl: four intervariceal ribs (two between each pair of varices). Intervarices more and more prominent from the fifth whorl onwards. Intervariceal nodules more developed on P2 and P3. P1 spine short, present on third to sixth whorls, disappearing on seventh whorl. Short spine on MP disappearing on last varix. Aperture oval, 35.3% of diameter, 22.3% of height (including siphonal canal). Columellar lip with two knobs abapically. Columellar rim partially erect, adherent adapically. Anal sulcus present. Parietal callus well-developed. Internal crenulations occurring between each pair of primary cords. Siphonal canal up to 50% of aperture length, bent dorsally and towards the right. Colour cream to orange. Intervariceal spaces orange with three clear brown spiral bands slightly marked, darker on varices and on intervariceal nodes. First brown spiral band covers P2 and P3; second band covers P4 and P5; third band covers P6 and s6. Operculum with apical nucleus. Animal and radula unknown.

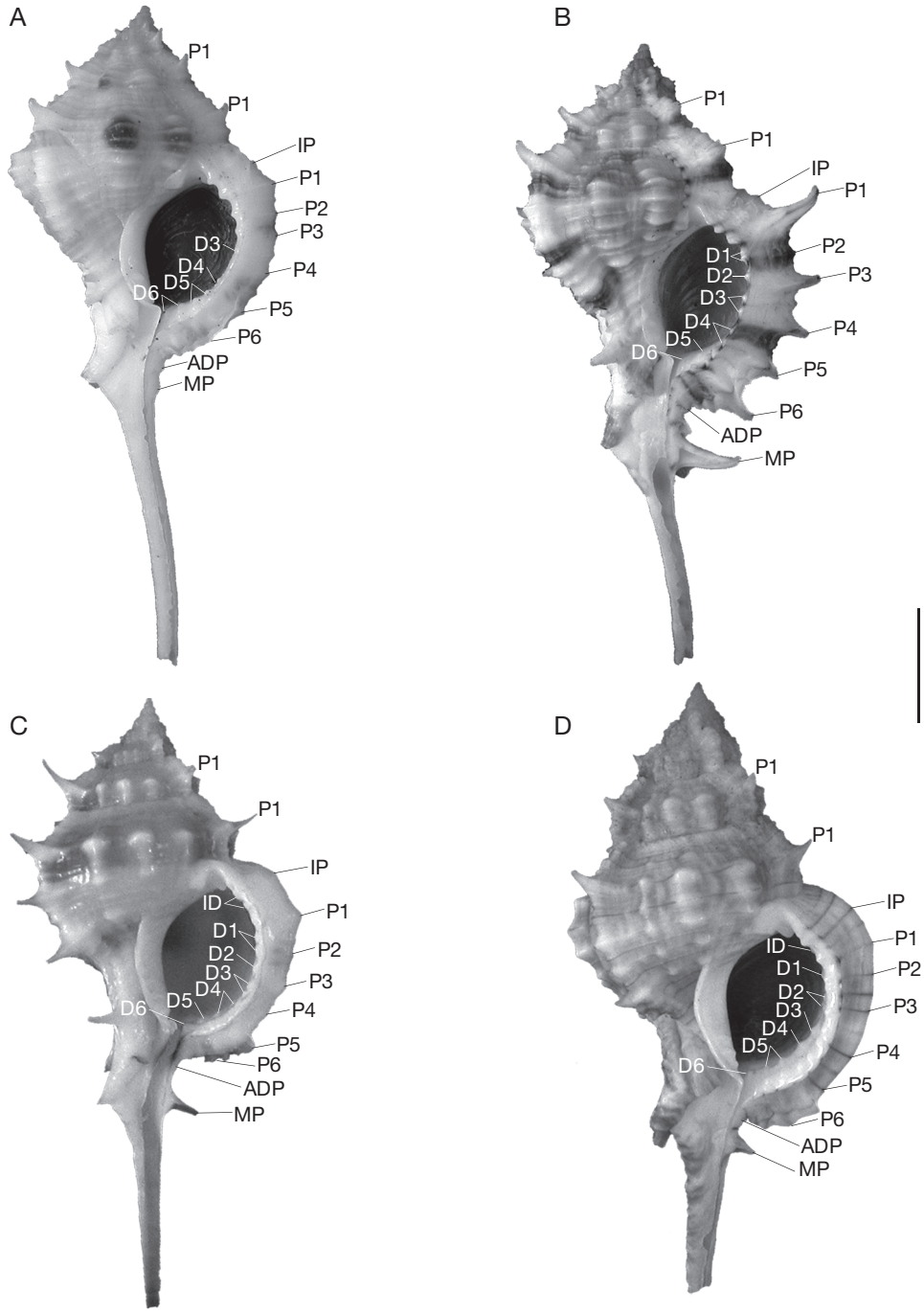

FIG. 9. — Primary cords and internal denticles of the outer lip of *Siratus cailleti* (Petit de la Saussaye, 1856), *Siratus motacilla* (Gmelin, 1791) and *Siratus kugleri* (Clench & Pérez Farfante, 1945): **A**, *S. cailleti*, Coll. BG, Marie Galante Island at 250 m deep, Guadeloupe (H: 59.9 mm); **B**, *S. motacilla*, Coll. BG, Martinique (H: 52 mm); **C**, **D**, *S. kugleri*, Coll. BG, Cuba, at 100 m deep (H: 53.7 mm). Scale bar: 10 mm.

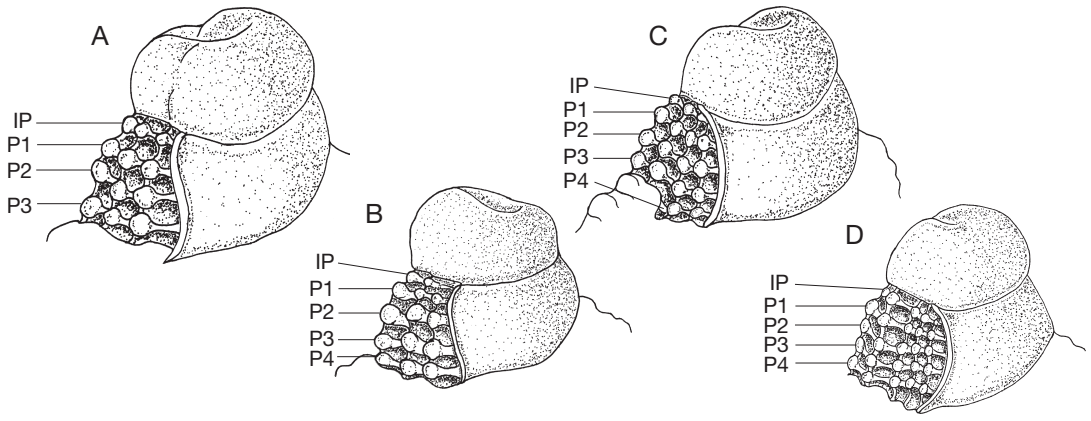

Fig. 10. — Protoconch and first teleoconch whorl of *Siratus pointieri* n. sp., *S. cailleti* (Petit de la Saussaye, 1856), *S. motacilla* (Gmelin, 1791) and *S. kugleri* (Clench & Pérez Farfante, 1945): **A**, *S. pointieri* n. sp., paratype, Coll. BG, Las Salinas at 250 m deep, Dominican Republic; **B**, *S. cailleti*, Coll. BG, Marie Galante at 250 m deep, Guadeloupe; **C**, *S. motacilla*, Coll. BG, Martinique. **D**, *S. kugleri*, Coll. BG, Cuba, at 100 m deep. Scale bar: 1 mm.

Intraspecific variations

The number of protoconch whorls varies from 2.0 to 2.1 (four specimens studied). The number of protovarices varies from 12 to 14 on the first whorl and from 10 to 11 on the second whorl. The spire height represents 49-53% of the total height. The aperture width represents 35-38% of the diameter.

Interspecific comparison

Siratus pointieri n. sp. may be compared to three recent species: 1) *Siratus cailleti* (Petit de la Saussaye,1856) from Martinique (250 m deep), Desirade (220-250 m deep) and Saba Bank (200m); 2) *Siratus motacilla* (Gmelin, 1791) from Martinique (70 m deep) and St-Vincent (171 m deep) and Barbados (100 m deep); and 3) *Siratus kugleri* (Clench & Pérez Farfante, 1945) from Guadeloupe (40 m deep) and Cuba (100 m deep). Our comparison is based on 55 specimens of *S. cailleti*, 45 specimens of *S. kugleri* and 7 specimens of *S. motacilla*. *Siratus motacilla* (Figs 9A; 10C) is distinguished by its paucispiral protoconch of 1.5 whorls, and by its shorter spire. Regarding the axial sculpture, the total number of protovarices on first and second whorls is generally higher, varying from 17 to 14 in *S. motacilla*, instead of from 14 to 10 in *S. pointieri* n. sp. The spiral sculpture consists of thick, strongly developed cords on the last whorl in *S. motacilla*, whereas it consists of very fine cords in *S. pointieri* n. sp. On the siphonal canal, ADP and MP cord spines are present in adults of *S. motacilla*, whereas they are absent in *S. pointieri* n. sp. The colour pattern of *S. motacilla* bears brown bands between P1 and P2, P3 and P4 and between P5 and P6. These brown bands are absent in *S. pointieri* n. sp. *Siratus cailleti* (Figs 9B; 10B) is also distinguishable by its paucispiral protoconch of 1.5 to 1.7 whorls and by its shorter spire. Regarding the axial sculpture, the total number of protovarices on the first and second whorls is generally higher, varying from 17 to 12 in *S. cailleti*, instead of from 14 to 10 in *S. pointieri* n. sp. As for *S. motacilla*, the spiral sculpture consists of thick, strongly developed cords on the last whorl in *S. cailleti*, whereas it consists of very fine cords in *S. pointieri* n. sp. The shell colour is whitish in *S. cailleti*, instead of cream to orange in *S. pointieri* n. sp. *Siratus kugleri* differs by its protoconchs of 1.5 whorls instead 2 whorls in *S. pointieri* n. sp. *Siratus kugleri* also differs by the posterior part of the outer lip which is thickened and angulose (Fig. 9C, D). The adults of *S. kugleri* display a spiny MP (Fig. 9C, D), while this cord spine is missing in the adults

of *S. pointieri* n. sp. (Fig. 8B). On the last whorl of *S. pointieri* n. sp., the primary, secondary and tertiary cords tend to have a similar small size. In *S. kugleri*, the tertiary cords are missing and the major cords (primary cords and secondary cords s2, s3, s4 and s5) are well developed. The colour of the shell background of *S. kugleri* varies from creamy to more or less brown with sometimes darker spiral bands, but it is never orange as in *S. pointieri* n. sp.

Acknowledgements
We are grateful to Dominique Lamy, Jean-Pierre Pointier, Patrice de Jaham, Régis Delannoye, B. Besse and F. Hennequin who provided specimens from Dominican Republic and Martinique, and to Gilles Granpoder who participated in our research on data and specimens in the genus *Homalocantha*. Our thanks go also to Megan Paustian (CMNH) for the photo of *M. sunderlandi* and to A. G. Beu (GNS Science, New Zealand) and an anonymous reviewer for their comments improving this paper.

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Submitted on 10 May 2011;
accepted on 7 September 2011.