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Distribution of the *Strombus gibberulus* complex in Indonesia (Gastropoda, Strombidae)

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ABSTRACT

Strombus gibberulus gibberulus L. is living in Indonesia at the western coast of Sumatra from Sabang to the Straits Sunda, and via the Straits in the Java Sea as far as Djakarta Bay. In all the rest of the Indonesian Archipelago the subspecies *gibbosus* (Röding) is found. The differences between *gibberulus* s.str., *gibbosus*, and the subspecies *albus* Mörch are given.

INTRODUCTION

In his excellent monograph on the Strombidae of the Indo-Pacific, Abbott (1960: 140—144) recognized three subspecies of *Strombus* (*Gibberulus*) *gibberulus* Linné, 1758. Typical *gibberulus* is living in the Indian Ocean, exclusive of South Africa, the Red Sea and Australia. In the Red Sea the subspecies *albus* Mörch, 1850 (syn. *rhodostomus* von Martens, 1869) occurs; the subspecies *gibbosus* (Röding, 1798) is reported from Indonesia, northeast Australia, the Philippines and north to Okinawa, the Melanesian, Micronesian, and Polynesian islands in the Pacific, except of the Hawaiian chain.

Since Abbott (l.c.: pl. 116) did not had available many locality records from the Indonesian Archipelago, he was not able to mark exactly the occurrence of *gibberulus* s.str. and *gibbosus* in that area. To give a more precise geographical distribution, the authors have studied several museum and private collections containing material from Indonesia.

We have used Abbott's taxonomy for the Strombidae, therefore the species *gibberulus* is placed in the genus *Strombus*, subgenus *Gibberulus*. Some malacologists consider *Gibberulus* Jousseaume, 1888 as a full genus, in which *Gibberulus gibberulus* (Linné) is the only species.

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DISTINCTION OF THE SUBSPECIES OF *Strombus gibberulus*

The three subspecies can be recognized on the following characters of the shell :

	<i>gibberulus</i> figs. 1—4	<i>gibbosus</i> fig. 6	<i>albus</i> fig. 5
length	30—70 mm	30—55 mm	30—60 mm
colour pattern of last whorl	yellow to grayish tan, with many fine spiral white lines, occasionally with brown zigzag pattern	yellow or brown bands, or banded flecks	white
colour of columella	colourless to purple	colourless or (purple) brown	colourless, sometimes rose
colour of inside outer lip	purple	colourless or dark purplebrown	rose to reddish
spiral threads over last varix	present	not present	present
postnuclear whorls	with 5 or 6 incised spiral lines on the upper part of the whorl	a number of incised spiral lines over the whole whorl	a number of incised spiral lines over the whole whorl

FIG. 1. *Strombus gibberulus gibberulus* Linné, Rodrigues I., Mauritius, length 51 mm (coll. ZMA).

FIG. 2. *Strombus gibberulus gibberulus* Linné, Sabang, length 28½ mm (coll. ZMA).

FIG. 3. *Strombus gibberulus gibberulus* Linné, P. Tello, Batu Is, length 41½ mm (coll. ZMA).

FIG. 4. *Strombus gibberulus gibberulus* Linné, Djakarta Bay, Java, length 57 mm (coll. ZMA).

FIG. 5. *Strombus gibberulus albus* Mörch, Red Sea, Saudi Arabia near Obhur, length 45 mm (coll. ZMA, leg. Mora Williams).

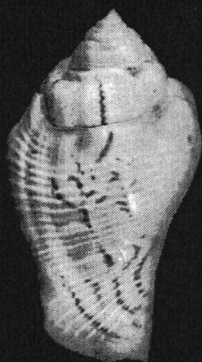
FIG. 6. *Strombus gibberulus gibbosus* (Röding), Malawali Channel, N. Borneo, length 37 mm (coll. ZMA, leg. Mary Saul).



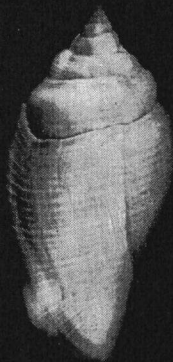
1



2



3



4



5



6

LOCALITY RECORDS FROM INDONESIA

The specimens studied are preserved in these collections:

- LB = L. J. M. Butot (De Bilt, Netherlands)
MS = Mrs. Mary Saul (Malvern, England)
RMNH = Rijksmuseum van Natuurlijke Historie (Leiden)
ZMA = Zoölogisch Museum Amsterdam.

(The abbreviation P. = pulau = island).

***Strombus gibberulus gibberulus* Linné**

SUMATRA : Sabang (3 specimens, ZMA) — fig. 2; Simalur, Sinabang (2 spec. RMNH), Labuan Badjan (2 spec. RMNH); Batu Is, P. Tello (5 spec. ZMA) — fig. 3.

JAVA : P. Panaitan (= Prinsen Isl.) (3 spec. LB); Duizend Is, P. Kelapa (2 spec. RMNH), P. Pajung (4 spec. LB); Djakarta Bay (3 spec. RMNH, 4 spec. ZMA) — fig. 4, P. Edam (1 spec. ZMA).

KANGEAN ISLS, Anakrangean, Sapeken (1 spec. RMNH).

***Strombus gibberulus gibbosus* (Röding)**

SINGAPORE (2 spec. RMNH); BANKA (4 spec. RMNH, 2 spec. ZMA).

JAVA : Nusa Barung (1 spec. RMNH); Madura (8 spec. RMNH).

BORNEO : P. Mengalum (1 spec. MS); Kudat, Marua Bay (3 spec. MS); Malawali Channel (6 spec. ZMA, leg. MS) — fig. 6; P. Mandidarah (2 spec. MS); Semporna (2 spec. MS).

CELEBES : Spermonde Is (1 spec. ZMA); Panikiang (17 spec. RMNH); Tanah Keke (2 spec. RMNH); between Kabaena and Muna (5 spec. RMNH); Butung (11 spec. RMNH); Tiger Is (1 spec. RMNH).

BALI (5 spec. RMNH).

FLORES : (9 spec. RMNH); Bay of Ende (1 spec. ZMA); Larantuka (many spec. ZMA); Groot Bastaard, Neli (1 spec. ZMA).

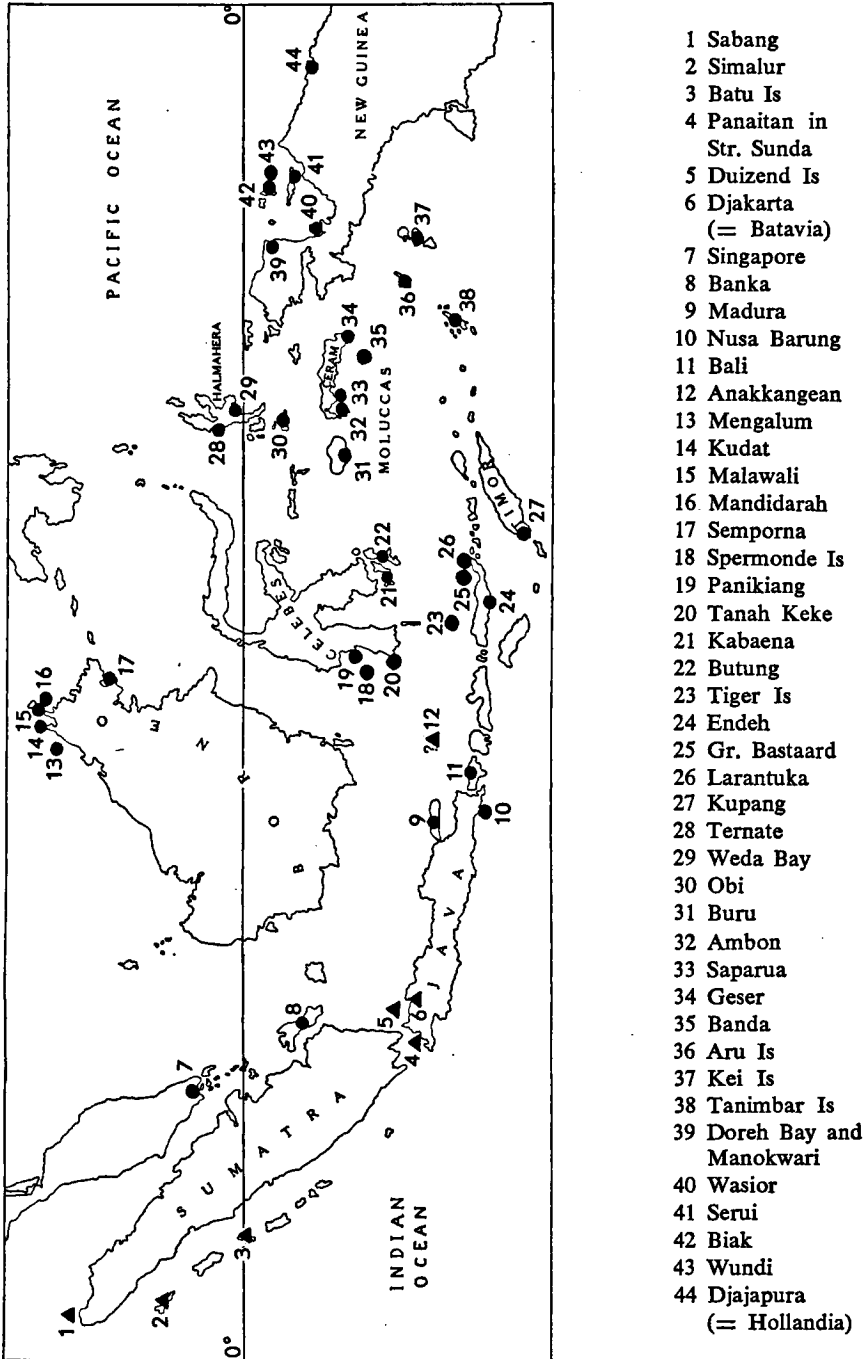
TIMOR : (many spec. RMNH); Kupang Bay (3 spec. ZMA); beach of Namsain, near Kupang (1 spec. ZMA).

MOLUCCAS : Halmahera, Weda Bay (1 spec. RMNH); Ternate (1 spec. ZMA); Obi (17 spec. RMNH); Buru, Leksula (19 spec. RMNH); Ceram, Geser atoll (2 spec. RMNH); Ambon (23 spec. RMNH, 7 spec. ZMA); Saparua (1 spec. RMNH); Banda (many spec. RMNH, 6 spec. ZMA); Aru and Kei Is (5 spec. ZMA); Tanimbar Is (2 spec. ZMA).

NEW GUINEA : Doreh Bay (4 spec. RMNH); Manokwari (10 spec. ZMA); Wasior, Wandamen Bay (16 spec. ZMA); Japen, Serui Bay (4 spec. ZMA); Schouten Is, Biak (8 spec. ZMA); Wundi (11 spec. ZMA); Djajapura (= Hollandia) (3 spec. ZMA).

DISCUSSION

From the material studied it is obvious that *Strombus gibberulus gibberulus* is confined to the Indian Ocean, and has penetrated via the Straits Sunda into the Java Sea as far as Djakarta Bay (fig. 7). We have seen two specimens from outside this area: the Rijksmuseum van Natuurlijke Historie has one specimen of *gibberulus* s.str. from Anakrangean Island in the Java



- 1 Sabang
- 2 Simalur
- 3 Batu Is
- 4 Panaitan in Str. Sunda
- 5 Duizend Is
- 6 Djakarta (= Batavia)
- 7 Singapur
- 8 Banka
- 9 Madura
- 10 Nusa Barung
- 11 Bali
- 12 Anakkangean
- 13 Mengalum
- 14 Kudat
- 15 Malawali
- 16 Mandidarah
- 17 Semporna
- 18 Spermonde Is
- 19 Panikiang
- 20 Tanah Keke
- 21 Kabaena
- 22 Butung
- 23 Tiger Is
- 24 Endeh
- 25 Gr. Bastard
- 26 Larantuka
- 27 Kupang
- 28 Ternate
- 29 Weda Bay
- 30 Obi
- 31 Buru
- 32 Ambon
- 33 Saparua
- 34 Geser
- 35 Banda
- 36 Aru Is
- 37 Kei Is
- 38 Tanimbar Is
- 39 Doreh Bay and Manokwari
- 40 Wasior
- 41 Serui
- 42 Biak
- 43 Wundi
- 44 Djajapura (= Hollandia)

FIG. 7. Geographical distribution of *Strombus gibberulus* Linné in Indonesia.
 ▲ *gibberulus* s.str. ● subsp. *gibbosus* (Röding)

Sea, east of Madura. The collection of the Academy of Natural Sciences in Philadelphia contains one specimen from Hongkong, Castle Peak Bay, said to come from fishermen (Abbott, l.c.: 143). Since both lots have just one specimen, and because these two places are surrounded by localities where only the subspecies *gibbosus* is living, we are doubtful about the Anakkan-gean and the Hongkong records.

Strombus gibberulus gibbosus is the subspecies of the Pacific Ocean and the waters of the Indonesian Archipelago east of Sumatra (fig. 7).

We did not find any locality record where both subspecies are living together.

LITERATURE

ABBOTT, R. TUCKER

1960 The genus *Strombus* in the Indo-Pacific.— *Indo-Pacific Mollusca*, 1 (2): 33—146.

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