

Gloria Maris	49 ( 1 )	7-13	Antwerpen, January 2010
--------------	----------	------	-------------------------

**A hybrid in the genus *Ministrombus* Bandel, 2007  
(Gastropoda: Strombidae) and a new combination for  
*Strombus variabilis* Swainson, 1820**

Aart M. DEKKERS

Koewijzend 12 B, 1695 CG Blokker, The Netherlands  
aart.dekkers@wxs.nl

**Keywords:** STROMBIDAE, *Ministrombus*, hybrid, Philippines.

**Abstract:** A hybrid in the genus *Ministrombus* Bandel, 2007 is reported here for the first time. Based on shell characteristics, the supposed involved parent species are *M. variabilis* (Swainson, 1820) and *M. minimus* (Linnaeus, 1771). The hybrid specimen originates from the Philippines. The combination *Ministrombus variabilis* is a new combination, formerly this species was included in the genus *Dolomena* Wenz, 1940 (Iredale, 1931, nomen nudem).

**Introduction:** For several years, the author has been collecting many **Strombidae** specimens from all over their distributional ranges and with all possible designs, colours and forms to get a good understanding of the variability of the species in the family. In August 2008, a shell that looked like an oddly coloured *Ministrombus variabilis* (Swainson, 1820) was acquired. It showed the general outline of *M. variabilis*, but with a design of axial brown flame-like streaks on a whitish ground colour, which had never been seen before. The ventral side of the shell bears a thickened anal canal bending towards the spire and the aperture shows a yellow interior. Both features are not seen in *M. variabilis*, but are instead the normal features of its smaller congeneric species *M. minimus* (Linnaeus, 1771).

**Hybridisation:** Hybrids in **Strombidae**, although still rare to uncommon in most cases, are well documented in recent literature from the early seventies of the previous century onwards, especially within the genus *Lambis*. Kronenberg (2008) discussed a new hybrid and gave an overview of 16 different hybridizations between species: 3 in the genus *Euprotomus*, 1 in *Doxander*, 1 in *Lentigo*, 2 in *Sinustrombus*, 1 *Lambis* x *Sinustrombus* and finally 8 different hybrids in *Lambis*. The new hybrid in the genus *Ministrombus* discussed in this paper can be added to this list.

One can wonder how many interbreeds we will finally have. In nature, a lot of barriers have to be taken to get hybridisation. One of the most interesting aspects around hybridisation is the problem of the parents of different species having to accept the other in the process of mating. Of course mating with the own kind is the preferred situation.

Owen et al. (1971) did much research on hybridisation in Eastern Pacific Abalones (**Haliotidae**). For **Haliotidae** the fertilization is external, the animals have no copulation organs. So, hybridisation in this family can only occur when two species are simultaneously releasing eggs and sperm into the water. The authors conclude (page 33) that the observations they made on documented hybrids indicate that hybridization is most prevalent in areas subjected to habitat disturbances, for example kelp bed destructions caused by sea urchins. Populations of different species, normally not in close contact, are then thrust together for food for instance. In my personal collection of **Haliotidae** a supposed hybrid between an East Pacific American species (*H. rufescens*) and an Asian Western Pacific species (*H. discus hannai*) is stored. This remarkable hybrid between species that do not live together originates from a *Haliotis* farm in China. So, species put together, e.g. in an aquarium or special marine basin, can in some cases produce hybrids which are not seen in nature.

Reed (1995) noted in her study that male strombids show little discrimination in the choice of their partner and have frequently been observed making attempts to mate with other males and females other than their own species. It seems that they showed a preference for females actually in the process of spawning. She also observed frequent interspecific mating between co-occurring species. Therefore, the great number of hybrids seen in **Strombidae** in the latest years might be caused by the indiscriminating sexual activity of the males and not as with **Haliotidae** caused by disturbances of the natural habitats. It might be a by-product of farming activities as a lot of species in **Strombidae** are on the human menu, just like *Haliotis* species. But besides farming activities in the Caribbean (the Queen Conch or *Lobatus gigas* (Linnaeus, 1758)), no other conch farming activities are known to me. Another very good reason might be the selective capacities of shell tradesmen who have now learned to recognize the hybrids from the millions of shells that are caught by the shellfish fishery industry each year.

## Abbreviations

AMD – the personal collection of the author

H – Height of the shell measured from the apex to the end of the canal

Superfamily: STROMBOIDAE

Family: **Strombidae** Rafinesque, 1815

Tribe: Canariini Dekkers, 2008

Genus: *Ministrombus* Bandel, 2007

Type species: *Strombus minimus* Linnaeus, 1771.

Diagnosis (Bandel 2007: 154): with pointed spire (40 degrees) with a median corner that bears nodes. The outer lip forms a lobe on a ridged end and is attached above the body whorl. A thickened callus ridge of inner lip continuous to the posterior canal. The siphonal canal is wide and upturned. Shell size ranges from 20-50 mm. For a picture Bandel (2007: 154) refers to Abbott (1960: pl.18 figs. 4 & 5).

**Discussion:** Bandel's new genus is monotypic. Only *Strombus minimus* is placed in this genus. Bandel erected *Ministrombus* as a subgenus of *Strombus*. The level of most subgenera within the genus *Strombus* is nowadays regarded as being of genus level (amongst others: Kronenberg, 2002; Dekker, 2002) This is also followed here and *Ministrombus* is used as *va* genus. Bandel (2007:154) only attributed *Strombus minimus*, being the type species, to his new subgenus. *Dolomena variabilis* (Swainson, 1820) was left in *Dolomena* by Bandel (2007: 154), because the outer lip resembles that of *Dolomena pulchella* (Reeve, 1851) and *D. hickeyi* (Willan, 2000).

However, the diagnosis given by Bandel fits very well for *variabilis* too. Only *variabilis* can grow slightly larger (up to 65 mm.) and the lobe formed by the outer lip on a ridged end is in the case of *variabilis* attached at the suture of the body whorl instead of above the body whorl as in *minimus*.

Yet, the diagnosis of the genus *Dolomena* as given by Bandel (2007: 152) is different: with pointed spire (45 degrees) ornamented with axial ribs, corner and spiral lines. The outer lip has a narrow to wide posterior sinus, and is attached to top of the body whorl or the whorl before it. The callus of the inner lip is narrow with ridges, which are also present on the inner side of the outer lip.

Both *minimus* and *variabilis* have no axial ribbing on the dorsum, no spiral ridges, a smooth callus and a smooth inner labrum, with exception of a few lirae situated between the stromboid notch and the canal. As *variabilis* does not fit in the diagnosis of *Dolomena*, but instead matches with a slightly altered diagnosis of *Ministrombus*, I transfer *variabilis* from *Dolomena* to *Ministrombus*.

The close relationship between *M. variabilis* and *M. minimus* is demonstrated by the presence of a hybrid between both species which is described in detail below.

*M. variabilis* (Swainson, 1820) x *M. minimus* (Linnaeus, 1771)

**Locality:** Philippines, Masbate, 20-30 m, from fishing boats. The specimen is kept in the personal collection of the author under number STR0913.

**Diagnosis:** Shell H 42.8 mm; W 23.5 mm, solid and heavy for the size, consisting of thick shell material. Shell with a flaring outer lip, body whorl smooth and shiny with 3 rounded knobs on the shoulder. Spire tall, shouldered, with heavy axial folds or knobs and few varices. Columella and edges of the posterior canal swollen. Edges of posterior canal bended to the left when seen from the ventral side to attach to the penultimate whorl. Broadly flaring outer lip, curving upwards. Stromboid notch rather shallow. Aperture and inside labrum smooth except for about 9 lirae between the stromboid notch and the canal.

Colour of the dorsum is white-cream as a ground colour, decorated with axially designed brown zig-zag streaks. Deep inside the aperture there is a very brightly yellow coloured band bordered by a glazed, thickened rim of the outer lip in the normal white to cream shell ground colour.

Operculum present, brown, serrated, with 5 serrations.

**Comparison:** The hybrid specimen can only be confused with shells of both supposed parent species. For a comparison the next table gives an overview. The arrows ( ← or → ) are used to indicate the conformity of a characteristic of the hybrid with the supposed parent.

Table 1: Comparison.

Characteristic	<i>M. variabilis</i>	hybrid	<i>M. minimus</i>
Size (H)	30- 62 mm	43.8 mm	15-45 mm
Shell	Light but solid	Heavy and solid →	Heavy and solid
Number of whorls	10	← 10	8
Spire	Spire tall, shouldered, with heavy axial folds or knobs and few varices.	← Spire tall, shouldered, with heavy axial folds or knobs and few varices.	Spire moderate , with small knobs on the shoulder and few varices.
Knobs on dorsum	2-4	3	1-3
Aperture decoration	Smooth	Smooth except for a few weak teeth anteriorly. →	Smooth except for a few weak teeth anteriorly.
Aperture colour	White-cream	White-cream with on the inside a bright yellow colour. →	White-cream with on the inside a bright yellow colour.
Stromboid notch	Shallow	← Shallow	Deep
Colour dorsum	Basic colour white to cream. Body whorl with 5 narrow, indistinct spiral white bands. Sometimes the pattern of axial streaks develops.	← Extreme axially orientated streaks forming zig-zag lines on a light basic colour.	Basic colour dark to light brown with minute flecks of cream and one or two rows of white squares.
Anterior canal	Straight to slightly bending towards the spire and not very thickened. Never reaching and attaching to previous whorl.	Very swollen edges of posterior canal bending to the left to attach to post ultimate whorl. →	Very swollen edges of posterior canal bending to the left to attach to post ultimate whorl.

**Acknowledgements:** I would like to thank Henk Dekker, Winkel, the Netherlands, for critically reading and improving the text. I thank Joop Wiersma, Kerkrade, The Netherlands, Koenraad De Turck, Herzele, Belgium and Ulrich Wieneke, Murnau, Germany for their opinions on the hybrid here reported. My thanks to David Monsecour, Aarschot, Belgium, for making the plate.

## References

- Abbott, R.T., 1960. The genus *Strombus* in the Indo Pacific. *Indo-Pacific Mollusca* 1 (2): 33-146.
- Dekker, H., 2002. A note on the distribution of two species of *Tibia* in Yemen (Gastropoda, Rostellariidae). *Vita Malacologica* 1(1): 33-37
- Duclos in Chenu, J.C., 1844. *Illustrations Conchiologiques*, Volume 4.
- Bandel, K., 2007. About the larval shell of some Stromboidea, connected to a review of the classification and phylogeny of the Strombimorpha (Caenogastropoda). *Paläontologie, Stratigraphie, Fazies* (15), *Freiberger Forschungshefte*, C524: 97-206; Freiberg.
- Kiener L.C., 1843 *Species Generale et Iconographie des Coquilles Vivantes*, Volume 4.
- Kronenberg, G.C., 2008. An intergeneric hybrid (Gastropoda: Caenogastropoda: Strombidae) with remarks on the subdivision of Indo-Pacific *Tricornis*. *Basteria* 72: 331-343
- Owen, B., McLean, J.H. & Meyer, R.J., 1971. Hybridization in the Eastern Pacific Abalones (*Haliotis*). *Bulletin of the Los Angeles County Museum of Natural History* 9:1-37.
- Reed, S.E., 1995. Reproductive anatomy of and biology of the genus *Strombus* in the Caribbean: I. Males. *Journal of Shellfish Research* 14: 325-330.
- Reed, S.E., 1995. Reproductive anatomy of and biology of the genus *Strombus* in the Caribbean: II. Females. *Journal of Shellfish Research* 14: 331-336.

## Plate

- 1-2. *M. variabilis* (Swainson, 1820), Philippines, 1998, H 60.1 mm. AMD STR0077
- 3-4. *M. variabilis* (Swainson, 1820) x *M. minimus* (Linnaeus, 1771), Philippines, 2008, Masbate, fishing boats at 20-30 m, H 42.8 mm. AMD STR0913
- 5-6. *M. minimus* (Linnaeus, 1771), Philippines, 1980, Batangas, Luzon Island. Collected just below the tide line. H 31.6 mm. AMD STR0063
7. *Strombus variabilis* in Kiener, 1843, pl. 21, fig. 2
8. *Strombus minimus* in Duclos, 1844, pl. 10, fig. 1-2



1



2



7



3



4

8



5



6