SINGAPORE MOLLUSCA: 3. THE FAMILY DONACIDAE
(BIVALVIA: VENEROIDA: TELLINOIDEA)

Siong Kiat Tan* and Martyn E. Y Low
Raffles Museum of Biodiversity Research, National University of Singapore
6 Science Drive 2, Singapore 117546, Republic of Singapore
(*Corresponding author: dbstsk@nus.edu.sg)

ABSTRACT. — The family Donacidae in Singapore is reviewed, and the occurrence of two species, Donax (Latona) cuneata and Donax (Latona) faba, is confirmed. Donax pallidus, which was first described from Singapore, is regarded to be a junior subjective synonym of Donax (Latona) faba based on examination of photographs of a syntype and topotypic material.

KEY WORDS. — Mollusca, Donacidae, Donax, Latona, taxonomy, synonymy, records, Singapore

INTRODUCTION

The family Donacidae Fleming, 1828, is large family of about 100 recognised species found worldwide in warm waters (Huber, 2010). These clams generally live shallowly-buried just under the surface of wave-swept parts of beaches in the intertidal zone. Wave action often flushes the animals out, which they then move with the wash before quickly reburying themselves with their strong foot (K. S. Tan & Chou, 2000).

In Singapore, donacids are abundant in some places where they occur and are sometimes collected for food. Being brightly and variably coloured, shells of donacids are quite attractive. Freshly dead articulate shells are usually widely splayed open, somewhat reminiscent of butterflies (Fig. 1). Empty shells sometimes occur in large numbers along the strandline of some beaches, where beachgoers have often been seen to delight in making a small collection of them.

Fig. 1. Donax (Latona) faba Gmelin, 1791, at Changi East Bay (Red Cliff Shoal; see Fig. 2 for location) showing the colourful, freshly-dead, articulate shells which are widely splayed open, and resemble butterflies. (Photograph by: S. K. Tan).
Herein, we report on the donacids from Singapore with descriptions and notes on their taxonomy, nomenclature, and local distribution. Details of records in the literature, and other notes of interest are also included. Two species of donacids, namely *Donax* (*Latona*) *cuneata* Linnaeus, 1758 and *Donax* (*Latona*) *faba* Gmelin, 1791, have been recorded from Singapore. *Donax pallidus* (Gould, 1850; type locality: Singapore) is herein identified as a junior subjective synonym of *Donax faba* Gmelin, 1791.

### MATERIAL AND METHODS

Relevant literature on the taxonomy of the family Donacidae was reviewed. Records of the species of the family Donacidae were compiled from a review of published literature. Primary synonyms and records mentioning Singapore are listed. Material from various collections were also examined. Abbreviations used for collections are: **ZRC** = Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore; and **TSK** = collection of the first author. Other abbreviations used: Measurements are given in the form of shell height (SH) × shell length (SL). Shell height is defined as the distance from the highest part of the dorsal side to the lowest part of the basal edge, and shell length is the perpendicular distance between the anterior and posterior ends. All measurements are in millimetres (mm).

### SYSTEMATIC ACCOUNTS

**SUPERFAMILY TELLINOIDEA BLAINVILLE, 1814**

**FAMILY DONACIDAE FLEMING, 1828**


**Genus Donax Linnaeus, 1758**

*Donax* Linnaeus, 1758: 682 (type species *Donax rugosus* Linnaeus, 1758, by subsequent designation by Anton, 1838: 3; gender feminine).

*Remarks.* — The gender of *Donax* is regarded as feminine based on the names originally included by Linnaeus (e.g., *rugosa*, *denticulata*, *scripta*).

**Subgenus Latona Schumacher, 1817**


*Remarks.* — The genus-group name *Latona* Schumacher, 1817, was placed on the Official List of Names in Zoology in Opinion 1057 (ICZN, 1976: 19). As the name is in current usage for a genus or subgenus of bivalve molluscs, all later uses of the genus-group name *Latona* are unavailable junior homonyms. This includes the cladoceran genus-group *Latona* Strauss, 1820, which is also in current use for the group of crustaceans (e.g., Korosi & Smol, 2012).

**Donax (Latona) cuneata Linnaeus, 1758**

(Figs. 2, 3)

*Donax cuneata* Linnaeus, 1758: 683, no. 87 (type locality: none).

**Singapore records:**

*Donax* sp. — Traill, 1847: 239; K. S. Tan & Chou, 2000: 147 [in part; bottom two shells in upper figure].


**Material examined.** — **Singapore:** Tanah Merah Ferry Terminal (TSK 22809), 22 Apr. 2001; East Coast Park, just east of Sungei Bedok (TSK), 13 Nov. 2005.

**Distribution in Singapore.** — See Fig. 2.
Fig. 2. Distribution of the family Donacidae Fleming, 1828, in Singapore: ○, *Donax (Latona) cuneata* Linnaeus, 1758; and ▲, *Donax (Latona) faba* Gmelin, 1791. Solid symbols represent records based on material examined, while open symbols represent records from both published literature and unpublished data. Abbreviations used: BE, Bedok; CH1, Changi East Bay (Red Cliff Sheal); CH2, Changi (carpark 7 area); CH3, Changi; CP, Changi Point Beach; EC1 (East Coast Park, just east of Sungei Bedok); EC2, East Coast Park (Katong area); ME, Marina East; NS, National Service Resort and Country Club; SI, Siglap; TM, Tanah Merah Ferry Terminal; PT, Pulau Tekukor (east side).

**Habitat.** — Intertidal, shallowly buried in sand of exposed sandy beaches, migrating up and down between the high and low tide marks following the ebb and flow of the tide (Poutiers, 1998; K. S. Tan & Chou, 2000; pers. obs.).

**Diagnosis.** — The following diagnosis is based on specimens from Singapore and Swennen et al. (2001). Shell solid, compressed, distinctly inequilateral, trigonal-ovate in outline, to about 35 mm long; surface smooth with fine concentric lines, radial sculpture distinct at posterior end, forming reticulate scale-like sculpture. Colour variable: white, cream, brown, grey; usually with radial bands of varying thickness and prominence; interior white to purple, often with tinted yellow, brown or purple blotch.

**Remarks.** — This is the more uncommon of the two species currently known from Singapore. It was first recorded from Singapore by Traill (1847) as an unidentified *Donax* species (see Discussion). This species is superficially similar to *Donax faba*, but may be easily diagnosed by the presence of radial ridges and reticulate sculpture at the posterior end. Lamprell & Whitehead (1992) provides a list of synonyms of this species.

*Donax (Latona) faba* Gmelin, 1791
(Figs. 1, 2, 4–6)

*Donax faba* Gmelin, 1791: 3264, no. 8 (type locality: none).
*Donax radians* Lamarck, 1818: 547, no. 6 (type locality: none).
*Donax pallidus* Gould, 1850: 254, 255 (type locality: Singapore) [new synonym].
Fig. 3. *Donax (Latona) cuneata* Linnaeus, 1758, from Singapore: A, B, Tanah Merah Ferry Terminal (SH 21.0 × SL 26.8 mm; TSK 22809); C, D, East Coast Park (SH 21.9 × SL 29.0 mm; TSK). Scale bars = 10 mm. (Photographs by: S. K. Tan).

Fig. 4. *Donax (Latona) faba* Gmelin, 1791, from Singapore: A, B, Tanah Merah Ferry Terminal (SH 17.1 × SL 25.2 mm); C, D, National Service Resort and Country Club (SH 17.3 × SL 27 mm). Scale bars = 10 mm. (Photographs by: S. K. Tan).
Fig. 5. Variation in shell shape, colour and patterns in Singapore populations of *Donax (Latona) faba* Gmelin, 1791: A–D, Tanah Merah Ferry Terminal (A, B, SH 17.1 × SL 25.2 mm; C, D, SH 16.4 × SL 23.5 mm; TSK 22810); E–N, National Service Resort and Country Club (E, F, SH 17.3 × SL 27.0 mm; G, H, SH 16.3 × SL 23.7 mm; I, J, SH 15.3 × SL 24.0 mm; K, L, 16.4 × SL 25.5 mm). Scale bars = 10 mm. (Photographs by: S. K. Tan).

**Singapore records:**

*Donax* sp. — Traill, 1847: 239 (first record); K. S. Tan & Chou, 2000: 147 [in part; topmost shell in upper figure and lower figure]

*Donax pallidus* Gould, 1850: 254, 255.


**Distribution in Singapore.** — See Fig. 2.

**Habitat.** — Intertidal, shallowly buried in sand of wave swept sandy beaches, migrating between the high and low tide marks of the beach slopes following the ebb and flow of the tides (Poutiers, 1998; K. S. Tan & Chou, 2000; pers. obs.)

**Diagnosis.** — The following diagnosis is based on specimens from Singapore and Swennen et al. (2001). Shell thick, compressed, inequilateral, trigonal-ovate in outline, to about 25 mm long; surface smooth with fine concentric lines that are usually more pronounced and appear as ridges on the posterior side. Colour variable: white, cream, brown, green, grey, purple; often with one or more radial bands and random maculations; interior white, often with tinted yellow or with purplish blotches, to purple, usually with whitish blotches and/or radial bands.
Fig. 6. *Donax (Latona) faba* Gmelin, 1791 from Singapore: A–D, the syntype of *Donax pallidus* Gould, 1850 (USNM 17942) first described from Singapore and now a junior subjective synonym of *Donax (Latona) faba* Gmelin, 1791 (see text for details); E, F, a topotypic specimen of *Donax (Latona) faba* Gmelin, 1791, from the National Service Resort and Country Club (SH 14.6 × SL 21.3 mm, see Fig. 2 for location), for comparison. Scale bars = 10 mm. (Photographs by: the Smithsonian Institution [A–D], and S. K. Tan [E, F]).

**Remarks.** — This is a common, sometimes locally abundant species of sandy beaches in Singapore. It was first recorded from Singapore by Traill (1847) as an unidentified *Donax* species (see Discussion). The shell is somewhat similar to *Donax cuneata*, but is generally more slender in shape and easily distinguished by the lack of radial sculpture at the posterior end.

*Donax pallidus* Gould, 1850, has been recognised as a valid species by some authors (e.g., Drivas & Jay, 1988: 56), but it was suggested to be possibly synonymous with *Donax (Dentilatona) incarnata* (Gmelin, 1791) by Huber (2010). A comparison however, of Gould’s figure and syntype (USNM 17942) of *Donax pallidus* clearly shows that the taxon is a pale form of *Donax (Latona) faba* Gmelin, 1791 (see Fig. 6). *Donax pallidus* is therefore regarded a junior subjective synonym of *Donax (Latona) faba*. Incidentally, Singapore is the type locality of *Donax pallidus*, and *Donax incarnata* has not been recorded from Singapore to date.

**DISCUSSION**

Two unidentified species of *Donax* were listed in Traill (1847) whose catalogue included shells from Singapore and its vicinity. Although neither figures nor references were provided, we herein presume that Traill’s unidentified species are *Donax (Latona) cuneata* and *Donax (Latona) faba* since these are the only two species with a confirmed presence in Singapore to date.

**ACKNOWLEDGEMENTS**

The images of the syntype *Donax pallidus* Gould, 1850, are reproduced with the permission of the Smithsonian Institution, Washington, D.C., and we acknowledge the assistance of M. G. Harasewych in obtaining these images.

**LITERATURE CITED**

