PHLEBOBRANCHIA

The suborder Phlebobranchia (order Enterogona) is characterised by having unpaired gonads present only on the same side of the body as the gut. As in Stolidobranchia, the body is not divided into different sections (such as thorax, abdomen and posterior abdomen) as the gut is folded up in the parietal body wall outside the pharynx and the large branchial sac occupies the whole length of the body. Usually the branchial sac (which is flat, without folds) has internal longitudinal vessels (although only vestiges remain in Agneziidae). Epicardial sacs do not persist in adults as they do in Aplousobranchia, although excretory vesicles (nephrocytes) embedded in the body wall over the gut are known to originate from the embryonic epicardium in Ascidiidae and Corellidae. Most phlebobranchs are solitary. However, Plurellidae Kott, 1973 includes both solitary and colonial forms, and Perophoridae Giard, 1872 are all colonial. Replication in Perophoridae is from ectodermal epithelium (rather than endodermal or mesodermal tissue the mesodermal tissue of the vascular stolon (rather than the endodermal tissue as in most as in Aplousobranchia). The process of replication has not been investigated in Plurellidae.

Phlebobranch taxa occurring in Australia are documented in Kott (1985). Family level taxa are characterised principally by the size and form of the branchial sac including the number of branchial vessels and form of the stigmata; the form, size and position of the gonads; and the habit (colonial or solitary) of the taxon. Berrill (1950) has discussed problems in assessing the phylogeny of Perophoridae.

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AGNEZIIDAE

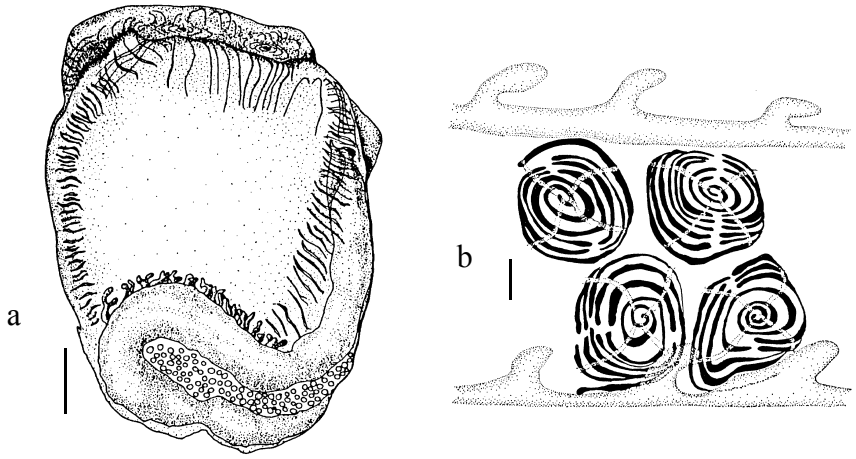

Fig. 14. *Agnezia glaciata* (Michaelsen, 1898): **a**, body removed from the test, from left side; **b**, portion of the branchial sac. (Scale bars: a, 1.0 mm; b, 0.25 mm). [from Kott 1985]

The family Agneziidae Monniot & Monniot, 1991 is a group of diverse genera. There are two subfamilies, Agneziinae Monniot & Monniot, 1991 with stigmata spiralling around cones or infundibula projecting into the pharynx, and Ciallusiinae Huus, 1937 with straight stigmata. The latter subfamily is not yet recorded from Australia. The family is distinguished by the loss of the longitudinal branchial vessels (present in most phlebobranchs), although vestiges in the form of bifid or undivided papillae are present on the transverse vessels.

In Agneziinae the test is thin and often has embedded sand making it stiff and brittle. However (in contrast to the Plurellidae), parts of the body wall are not embedded in the test—rather the body musculature is modified to take advantage of the stiff test in other ways. Thus, short parallel bands of muscles around its outer margin, and along each side of the antero-median apertures, tend to flatten the body. When the muscles are contracted the soft, thin sand-free strips of test in which the sessile apertures are located, are withdrawn and folds of hard, sandy test close over them as protective lips. The short parallel bands of muscle around the median line of the body occur in other taxa in which the sand-embedded test is thin enough to be brittle rather than tough, *e.g. Molgula* Forbes, 1848 has species in which the apertures can be withdrawn and covered by the stiff brittle test in the same way.

A single species of *Agnezia* Monniot & Monniot, 1991 (a replacement name for *Agnesia* Michaelsen, 1898) and three of *Adagnesia* Kott, 1963 are recorded from Australia. They are not recorded often and probably occur principally on the sea floor, a habitat seldom explored around this continent. Two of the *Adagnesia* species have a novel orientation of gonoducts through the gut loop and directed anteriorly between the distal limb or pole of the loop and the outside of the parietal body wall. The papillae on the transverse branchial vessels of *Adagnesia* are bifid but in *Agnezia* they are not divided.

Caenagnesia Ärnbäck, 1938 from the Antarctic, and *Proagnesia* Monniot & Monniot, 1973 from deep water, have not been recorded from Australia.

The family, (as Agnesiidae Huntsman, 1912), is discussed in Kott (1985).

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Huntsman, A.G. (1912). Ascidians from the coasts of Canada. *Trans. R. Can. Inst.* **9**: 111–148

Huus, J. (1937). Ascidiaceae. pp. 545–692 *in* Kükenthal, W. & Krumbach, T. (eds) *Handbuch der Zoologie.* Berlin : Walter de Gruyter Vol. 5(2)6

Kott, P. (1963). *Adagnesia opaca* gen. nov., sp. nov., a remarkable ascidian of the family Agnesiidae from Moreton Bay, Queensland. *Univ. Qd Pap. Dept. Zool.* **2**(3): 75–79

Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440

Monniot, C. & Monniot, F. (1973). Ascidies abyssales récoltées au cours de la campagne océanographique Biaçores par le *Jean Charcot*. *Bull. Mus. Natl. Hist. Nat. Paris (3)***93**(121): 389–475

Monniot, C. & Monniot, F. (1991). Tunicata: peuplements d'ascidies profondes en Nouvelle-Calédonie. Diversité des stratégies adaptatives. *In,* Crosnier, A. (ed) Résultats des Campagnes MUSORSTOM. Vol. 8 Mém. Mus. Natl. Hist. Nat. Paris *(4)***151**(A): 357–448.

AGNEZIINAE

Adagnesia Kott, 1963

Adagnesia Kott, P. (1963). *Adagnesia opaca* gen. nov., sp. nov., a remarkable ascidian of the family Agnesiidae from Moreton Bay, Queensland. *Univ. Qd Pap. Dept. Zool.* **2**(3): 75–79 [76].
Type species: *Adagnesia opaca* Kott, 1963 by original designation.

Extralimital distribution: north Atlantic Ocean, south Atlantic Ocean, east and south Pacific basins to 5000 m. See: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Adagnesia charcoti Monniot & Monniot, 1973

Adagnesia charcoti Monniot, C. & Monniot, F. (1973). Ascidies abyssales récoltées au cours de la campagne océanographique Biaçores par le *Jean Charcot*. *Bull. Mus. Natl. Hist. Nat. Paris (3)***93**(121): 389–475 [424].
Type data: syntypes MNHP p3.13–21*.
Type locality: abyssal, NE Atlantic Ocean.

Distribution: VIC (Bass Strait); deep basins of north and south Atlantic Ocean.
Ecology: benthic, marine; depth 22–5000 m.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Adagnesia opaca Kott, 1963

Adagnesia opaca Kott, P. (1963). *Adagnesia opaca* gen. nov., sp. nov., a remarkable ascidian of the family Agnesiidae from Moreton Bay, Queensland. *Univ. Qd Pap. Dept. Zool.* **2**(3): 75–79 [76].
Type data: holotype QM G4907, paratype(s) QM G4936.
Type locality: Moreton Bay, QLD.

Distribution: NSW (Central E coast), QLD (Central E coast), VIC (Bass Strait).
Ecology: benthic, marine, sand bottom.

Adagnesia venusta Kott, 1985

Adagnesia venusta Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [82].
Type data: holotype NMV H381, paratypes NMV F51569, NMV H394.
Type locality: Bass Strait, VIC.

Distribution: VIC (Bass Strait); known only from type locality.
Ecology: benthic, marine; fine sand with abundant sponges.

Agnezia Monniot & Monniot, 1991

Agnesia Michaelsen, W. (1898). Vorläufige Mitteilung uber einige Tunicaten aus dem Magalhaenischen Gebiet sowie von Süd-Georgien. *Zool. Anz.* **21**: 363–371 [370] [junior homonym of *Agnesia* Konnick, 1883 (Mollusca: Palaeozoic gastropod)].
Type species: *Agnesia glaciata* Michaelsen, 1898 by monotypy.

Agnezia Monniot, C. & Monniot, F. (1991). Tunicata: peuplements d'ascidies profondes en Nouvelle-Calédonie. Diversité des stratégies adaptatives. *In,* Crosnier, A. (ed) Résultats des Campagnes MUSORSTOM. Vol. 8 Mém. Mus. Natl. Hist. Nat. Paris *(4)***151**(A): 357–448. [383] [*nom. nov.* for *Agnesia* Michaelsen, 1898].

Extralimital distribution: Afrotropical Region, Antarctic Region; north Pacific Ocean, Kerguelen. See: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Agnezia glaciata (Michaelsen, 1898)

Agnesia glaciata Michaelsen, W. (1898). Vorläufige Mitteilung uber einige Tunicaten aus dem Magalhaenischen Gebiet sowie von Süd-Georgien. *Zool. Anz.* **21**: 363–371 [370].
Type data: syntypes ZMH leg.14.1.93*.
Type locality: Puerto Haberton, Beagle Channel, 14 m, Tierra del Fuego.

Agnesia krausei Michaelsen, W. (1912). Die Tethyiden (Styeliden) des Naturhistorischen Museum zu Hamburg, nebst nachtrag und Anhang einige anderen Familien betreffend. *Jahrb. Hamb. Wiss. Anst.* **28**(2): 109–186 [181].
Type data: syntypes ZMH 2 specimens*.
Type locality: Patagonian Shelf.

Agnesia himeboja Oka, A. (1915). Eine neue Ascidienart aus der Gattung *Agnesia* Michaelsen. *Annot. Zool. Jap.* 9: 1–6 [1].
Type data: syntypes UTZM 46* (M39).
Type locality: Tateyama Bay, Awa Province, 10–14 m, Japan.

Agnesia sabulosa Oka, A. (1929). Eine zweite japanische Art der Gattung. *Agnesia. Proc. Imp. Acad. Japan* **5**: 152–154 [152].
Type data: syntypes UTZM 150* (M236).
Type locality: Hakodate, 20–30 m, Japan.

Agnesia capensis Millar, R.H. (1955). On a collection of ascidians from South Africa. *Proc. Zool. Soc. Lond.* **125**(1): 169–221 [191].
Type data: holotype BMNH 29.4.48*.
Type locality: False Bay, 22–24 m, South Africa.

Taxonomic decision for synonymy: Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239 [97].

Distribution: Japan, New Zealand, South Africa, California, QLD (Central E coast), VIC (Bass Strait); Antarctic Peninsula, Kerguelen.
Ecology: benthic, marine; on hard, wide-spreading, branched, filamentous algae, or sandy bottoms.

ASCIDIIDAE

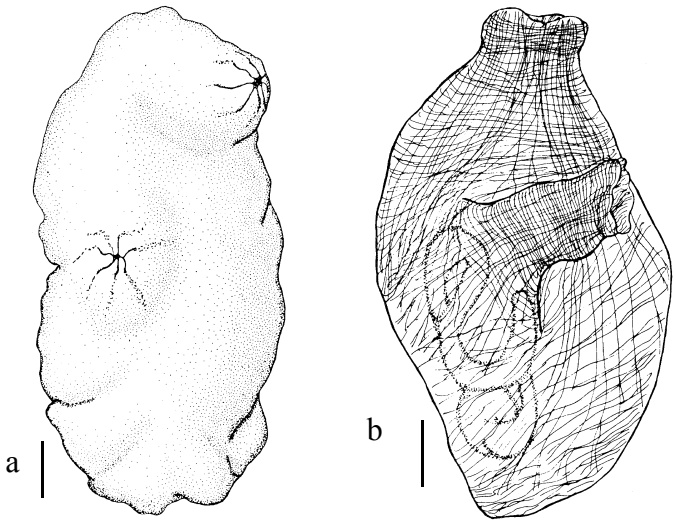

Fig. 15. *Ascidia decepta* Kott, 1985: **a**, external appearance; **b**, boby musculature. (Scale bars = 2.0 mm). [from Kott 1985]

The family Ascidiidae Herdman, 1882 contains solitary forms, usually with a relatively firm, inflexible, gelatinous, translucent test. The branchial sac is more or less flat, the branchial wall sometimes having minute undulations but usually lacking internal folds. The large gonads are enclosed in the gut loop and often spread over the inside of the gut, which is bent up in the left parietal body wall. The testis consists of branching follicles joined to a common vas deferens. The tubular ovary also branches. The vas deferens and thick ovarian tube are between two limbs of the gut loop, opening with the anus near the base of the atrial aperture. Body muscles usually form an irregular network over the right side of the body and anterior to the gut on the left, although they are inconspicuous over the gut.

Occasionally the test is brittle with embedded sand, *e.g. Ascidia thompsoni* Kott, 1952 and *Ascidia scaevola* (Sluiter, 1904). In *Ascidia scaevola*, long stiff, cylindrical tubes project up from around each sessile aperture providing channels to and from the surface for the excurrent and incurrent streams of water of individuals submerged in bottom sediments—a habitat that appears to be available owing to the stiff sand-embedded test that forms the rigid tubes. Other aspects of the morphology of this species are associated with the rigid, brittle test which would prevent overall contraction of the body. Generally, the body wall is thin with little or no musculature. However, short strong muscle bands are present across the dorsum to close folds of test over the apertures, and others along the right side narrow and depress the body inside its rigid casing. In addition, an unusual fold of the pharyngeal wall compensates for the narrowing of the right side of the body which has drawn the dorsal mid-line onto the upper surface.

The unusual morphology of *Ascidia scaevola* is unique amongst the otherwise relatively uniform species of this family and demonstrates a dramatic response to environmental pressure that parallel adaptations in *Plurella* spp. which has similar thin, rigid, sandy test.

The family contains three closely related genera:

Ascidiella Mueller, 1776, which contains only one well known species (the type of the genus), is known mostly from Europe. However, it is now recorded from Australia and New Zealand. It may have been spread by ships (Kott 1985). It differs from the other genera in the absence of secondary papillae projecting into the pharynx from the internal longitudinal vessels.

Phallusia Savigny, 1816 species are large with thick, firm and translucent test. The ciliated pit, the primary opening of the neural duct (at the base of the branchial siphon), is one- to two-thirds of the body length distant from the neural gland (just anterior to the atrial siphon). This is an appreciable distance when individuals are up to 60 mm or more in length. The accessory openings of the neural duct into the atrial cavity (characteristic of this genus) may be associated with that long neural duct (see Ruppert 1990 for an account of the role of the neural gland in the regulation of blood volume). Although their species diversity is not high (only five species being known), at least one *Phallusia* species is relatively common around the Australian continent.

Ascidia Linnaeus, 1767, has 19 recorded species in Australian waters. It is possible that this number will increase when more reliable characters (possibly obvious only in living specimens) are demonstrated. Although some species become as large as *Phallusia*, others remain relatively small, often with a thin fragile test, especially on the left side of the body where they are often attached to the substrate. Accessory openings of the neural gland duct do not occur.

Kott (1985) reviewed the family in Australian waters.

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Linnaeus, C. (1767). *Systema Naturae* per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Editio duodecim. Holmiae : Laurentii Salvii Tom. 2, pp. 1087, 1089, 1294, 1295, 1319

Mueller, O.F. (1776). pp. 224–226 *in, Zoologiae Danicae*. Copenhagen : Prodromus.

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Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. *In Mémoires sur les Animaux sans Vertèbres,* Pt 2. Paris : G. Dufour.

Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126

Ascidia Linnaeus, 1767

Ascidia Linnaeus, C. (1767). *Systema Naturae* per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Editio duodecim. Holmiae : Laurentii Salvii Tom. 2, pp. 1087, 1089, 1294, 1295, 1319 [1087] [without included species; *nomen conservandum*].
Type species: *Ascidia mentula* Mueller, 1776 by subsequent designation, see Hartmeyer, R., Michaelsen, W. & Sluiter, C.P. (1915). Tunicata. Ascidiae. *In,* Apstein, C. Nomina Conservanda. *Sber. Ges. Naturf. Freunde Berl.* **1915:** 185–186. [185].

Ascidiopsis Verrill, A.E. (1872). Recent additions to the molluscan fauna of New England and the adjacent waters, with notes on the other species. *Am. J. Sci. (ser. 3)***3**: 209–214, 281–290 pls 6–8 [214].
Type species: *Ascidiopsis complanata* Verrill, 1872 by original designation.

Bathyascidia Hartmeyer, R. (1901). Zur Kenntnis des genus *Rhodosoma*. *Arch. Naturg. Suppl.* **67**: 151–168 [166].
Type species: *Abyssascidia vasculosa* Herdman, 1888 by monotypy.

Phallusioides Huntsman, A.G. (1912). Ascidians from the coasts of Canada. *Trans. R. Can. Inst.* **9**: 111–148 [138].
Type species: *Ascidia obliqua* Alder, 1863 by original designation.

Taxonomic decision for synonymy: Huus, J. (1937). Ascidiaceae. pp. 545–692 *in* Kükenthal, W. & Krumbach, T. (eds) *Handbuch der Zoologie.* Berlin : Walter de Gruyter Vol. 5(2)6 [672]; Berrill, N.J. (1950). The Tunicata. *Ray Soc. Publs* **133**: 1–354 [152].

Extralimital distribution: Antarctic Region, Neotropical Region; worldwide. See: Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Harant, H. (1929). Ascidies provenant des croisières du Prince Albert 1er de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)***75**: 1–110; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Nishikawa, T. (1990). The ascidians of the Japan Sea 1. *Publ. Seto Mar. Biol. Lab.* **34**(4–6): 73–148.

Ascidia archaia Sluiter, 1890

Ascidia archaia Sluiter, C.P. (1890). Die Evertebraten aus der Sammlung des Königlichen Naturwissenschaftlichen Vereins in Niederländisch Indien in Batavia. *Nat. Tijdschr. Ned. Ind.* **50**: 329–348 [346].
Type data: holotype ZMA TU212.
Type locality: coral reef 'Vader Smit', Bay of Jakarta (as Djakarta), Indonesia.

Ascidia aperta Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [38].
Type data: syntypes ZMA TU206, TU211, ZMA TU211.
Type locality: 2.3 miles N 63°W from north point of Nuhu Jaan, 70 m, Kei Is., Indonesia [5°36'30"S 132°55'12"E].

Ascidia rhabdophora Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [45].
Type data: holotype whereabouts unknown (see Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [162]).
Type locality: Damar Is., 90 m, Indonesia.

Phallusia corelloides Van Name, W.G. (1924). Bijdragen tot de kennis der fauna van Curaçao. Resultaten einer Reis van Dr C.J. Van der Horst in 1920. Ascidians from Curaçao. *Bijdr. Dierk.* **23**: 23–32 [27].
Type data: holotype AMNH 730*, paratype(s) ZMA TU736.1, TU736.2, TU156*.
Type locality: Caracas Bay, Curaçao, West Indies.

Taxonomic decision for synonymy: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [26].

Distribution: NSW (Central E coast), QLD (Central E coast, Great Barrier Reef), WA (NW coast); West Indies; west Pacific Ocean.
Ecology: benthic, marine; under stones and rubble near reef crest of coral reefs, on sandy bottoms with coral and shells.

Ascidia capillata Sluiter, 1887

Ascidia capillata Sluiter, C.P. (1887). Einfache Ascidien aus der Bai von Batavia. *Nat. Tijdschr. Ned. Ind.* **46**: 242–266 [255].
Type data: holotype ZMA TU219.
Type locality: Bay of Jakarta (as Djakarta), Indonesia.

Ascidia austera Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [39].
Type data: holotype ZMA TU267.2.
Type locality: Anchorage north of Salomakiëe (Damar) Is., 45 m, Indonesia.

Taxonomic decision for synonymy: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [30].

Distribution: Indonesia, NSW (Lower E coast*), NT (N coast), QLD (Great Barrier Reef, NE coast), WA (N coast, SW coast).
Ecology: benthic, marine; on under-surface of rubble, coral reefs, on coral.

Ascidia challengeri Herdman, 1882

Ascidia challengeri Herdman, W.A. (1882). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt I, Ascidiae simplices. *Zool. Chall. Exped.* **6**(17): 1–296 [202].
Type data: holotype BMNH 1887.2.4.137.
Type locality: Kerguelen Is., Subantarctic.

Ascidia charcoti Sluiter, C.P. (1905). Note préliminaire sur les ascidiens holosomates de l'Expédition Antarctique Française commandée par le Dr. Charcot. *Bull. Mus. Natl. Hist. Nat. Paris* **11**: 470–475 [471].

Type data: syntypes MNHP p.3 ASC.A 50*, MNHP p.5 ASCA 118–125*, ZMA TU220.
Type locality: Booth Wandel Is., Antarctica.

Ascidia dispar Ärnbäck-Christie-Linde, A. (1938). Ascidiacea. *Further zool. Results Swed. Antarct. Exped. 1901–1* **3**(4): 1–54 [48].
Type data: holotype NHRM 1504*.
Type locality: Grytviken, 22 m, South Georgia [54°22'S 36°28'W].

Taxonomic decision for synonymy: Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239 [90].

Distribution: Heard & McDonald Islands, Kerguélen Island, TAS (Tas. coast); Heard Is., Antarctic Peninsula.
Ecology: benthic, marine; clay and algae.

Ascidia decepta Kott, 1985

Ascidia decepta Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [33].
Type data: holotype QM G10076, paratype(s) QM G9629, G10002, GH2571, GH2572.
Type locality: Fraser Is., 1 km from mouth of Moon Creek, off wreck, QLD.

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast, NE coast), SA (S Gulfs coast), TAS (Bass Strait).
Ecology: benthic, marine, mud bottom, sand bottom; shallow water.

Ascidia empheres Sluiter, 1895

Ascidia empheres Sluiter, C.P. (1895). Tunicaten. *In*, Semon, R. Zoologische Forschungsreisen in Australien und den Malayischen Archipel. *Denkschr. Med.- Naturw. Ges. Jena* **8:** 163–186; Nachtrag zu den tunicaten: 325–326. [177].
Type data: holotype ZMA TU227.
Type locality: Ambon, Indonesia.

Distribution: Indonesia, QLD (Central E coast, Great Barrier Reef, NE coast).
Ecology: benthic, marine; on under-surfaces of coral rubble.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ascidia gemmata Sluiter, 1895

Ascidia gemmata Sluiter, C.P. (1895). Tunicaten. *In*, Semon, R. Zoologische Forschungsreisen in Australien und den Malayischen Archipel. *Denkschr. Med.- Naturw. Ges. Jena* **8:** 163–186; Nachtrag zu den tunicaten: 325–326. [177].
Type data: syntypes ZMA TU235.
Type locality: Ambon, Indonesia.

Distribution: NSW (Lower E coast), NT (N coast), QLD (Great Barrier Reef, NE coast), VIC (Bass Strait), WA (Central W coast, Lower W coast, N coast, NW coast).
Ecology: benthic, marine.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ascidia glabra Hartmeyer, 1922

Ascidia glabra Hartmeyer, R. (1922). Miscellanea Ascidiologica. *Mitt. Zool. Mus. Berl.* **10**: 299–323 [305].
Type data: syntypes ZMH K1341*, ZMB 3846*.
Type locality: Fremantle, WA.

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast, Great Barrier Reef, NE coast), WA (Lower W coast).
Ecology: benthic, marine; under-surfaces of rubble, coral reefs.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ascidia kreagra Sluiter, 1895

Ascidia kreagra Sluiter, C.P. (1895). Tunicaten. *In*, Semon, R. Zoologische Forschungsreisen in Australien und den Malayischen Archipel. *Denkschr. Med.- Naturw. Ges. Jena* **8:** 163–186; Nachtrag zu den tunicaten: 325–326. [178].
Type data: holotype ZMA TU238.
Type locality: Ambon, Indonesia.

Distribution: Indonesia, QLD (Great Barrier Reef).
Ecology: benthic, marine; in crevices and on under-surfaces of rubble on coral reefs.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ascidia latesiphonica Hartmeyer, 1922

Ascidia latesiphonica Hartmeyer, R. (1922). Miscellanea Ascidiologica. *Mitt. Zool. Mus. Berl.* **10**: 299–323 [307].
Type data: holotype ZMH K1342*, paratype(s) ZMB 3848*.
Type locality: Shark Bay, Useless Inlet, Perlbanke, east coast of Bellefin Prong, 0–3.5 m, WA.

Ascidia malaca australiensis Hartmeyer, R. (1927). Zur Kenntnis phlebobranchiater und dictyobranchiater Ascidien. *Mitt. Zool. Mus. Berl.* **13**: 157–194 [161].
Type data: holotype ZMH K1343.
Type locality: Freshwater Bay, Swan River, WA.

Taxonomic decision for synonymy: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Distribution: QLD (Central E coast, NE coast), SA (S Gulfs coast), VIC (Bass Strait), WA (Central W coast, Lower W coast, NW coast).
Ecology: benthic, marine.

Ascidia liberata Sluiter, 1887

Ascidia liberata Sluiter, C.P. (1887). Einfache Ascidien aus der Bai von Batavia. *Nat. Tijdschr. Ned. Ind.* **46**: 242–266 [251].

Type data: holotype ZMA TU244.
Type locality: Bay of Jakarta (as Djakarta), 12–20 m, Indonesia.

Ascidia solomonensis Nishikawa, T. (1986). Ascidians from the Gilbert and Solomon Islands and Nauru. I. Perophoridae, Ascidiidae, Corellidae. *Int. Sci. Rev.* **32**: 1–78 4 maps [61].
Type data: holotype SMBL 338*, paratype(s) NSMT Pc682.
Type locality: Lavuro, NW Guadalcanal, intertidal, Solomon Is.

Ascidia dorsalis Monniot, C. (1987). Ascidies de Nouvelle-Calédonie I. Phlebobranches du Lagon. *Bull. Mus. Natl. Hist. Nat. Paris (4)***9A**(1): 3–31 [9].
Type data: holotype MNHP P5ASC A179*.
Type locality: Amédée, New Caledonia.

Taxonomic decision for synonymy: Kott, P. (1992). The Australian Ascidiacea, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655 [634].

Distribution: Indonesia, Norfolk Island, QLD (Great Barrier Reef, SE oceanic); west Pacific Ocean.
Ecology: benthic, marine; under-surface of rubble.

Ascidia munda Sluiter, 1898

Ascidia translucida Sluiter, C.P. (1890). Die Evertebraten aus der Sammlung des Königlichen Naturwissenschaftlichen Vereins in Niederländisch Indien in Batavia. *Nat. Tijdschr. Ned. Ind.* **50**: 329–348 [344] [junior homonym of *Ascidia translucida* Herdman, 1882].
Type data: type status unknown ZMA (depository uncertain, not found, see Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200).
Type locality: 'Vader Smit' Reef, Bay of Jakarta (as Djakarta), Indonesia, see Sluiter, C.P. (1890). Die Evertebraten aus der Sammlung des Königlichen Naturwissenschaftlichen Vereins in Niederländisch Indien in Batavia. *Nat. Tijdschr. Ned. Ind.* **50**: 329–348.

Ascidia munda Sluiter, C.P. (1898). Beiträge zur Kenntnis dei Fauna von Südafrica II. Tunicaten. *Zool. Jahrb. Syst.* **11**: 1–64 [5] [*nom. nov.* for *Ascidia translucida* Sluiter, 1890].

Distribution: Indonesia, NSW (Central E coast), QLD (Central E coast), WA (Central W coast, NW coast).
Ecology: benthic, marine.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ascidia nerea Kott, 1985

Ascidia nerea Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [46].
Type data: holotype QM G2562, paratype(s) QM GH2563.
Type locality: Gladstone Harbour, 1 km upstream from mouth of Calliope River, QLD.

Distribution: QLD (NE coast); known only from type locality.
Ecology: sand bottom, silt bottom; 8.3 km upstream, possibly in brackish water.

Ascidia occidentalis Kott, 1985

Ascidia occidentalis Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [46].
Type data: holotype WAM 912.83, paratype(s) WAM 118.72, 915.83, 916.83, 939.83.
Type locality: Cockburn Sound, off Rockingham, WA.

Distribution: WA (SW coast).
Ecology: benthic; Swan River estuary in brackish water.

Ascidia parasamea Kott, 1985

Ascidia parasamea Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [50].
Type data: holotype QM GH776, paratype(s) QM GH2521, GH2516.
Type locality: off Gordonvale, QLD [17°03'S 145°55'36"E].

Distribution: QLD (Great Barrier Reef, NE coast).
Ecology: benthic, marine; dredged, sandy substrate.

Ascidia prolata Kott, 1985

Ascidia prolata Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [50].
Type data: holotype QM GH2023.
Type locality: Ninepin Point, TAS.

Distribution: TAS (Tas. coast); known only from type locality.
Ecology: benthic, marine; wedged in crevices.

Ascidia scaevola (Sluiter, 1904)

Styelopsis scaevola Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [89].
Type data: holotype ZMA TU1066.
Type locality: 32 m, Indonesia [1°42'30"S 130°47'30"E].

Ascidia aclara Kott, P. (1952). Ascidians of Australia. 1. Stolidobranchiata and Phlebobranchiata. *Aust. J. Mar. Freshwat. Res.* **3**(3): 206–333 [309].
Type data: holotype AM Y1648.
Type locality: 5–6 miles E of Lakes Entrance, 38 m, VIC.

Taxonomic decision for synonymy: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [53].

Distribution: Indonesia, QLD (Central E coast, NE coast), SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait); west Pacific Ocean.
Ecology: benthic, marine; on and in sandy sediments, sand, small stones and shells.

Ascidia sydneiensis Stimpson, 1855

Ascidia sydneiensis Stimpson, W. (1855). Tunicata in descriptions of some new marine invertebrates. *Proc. Acad. Nat. Sci. Phila.* **7**: 387–388 [387].
Type data: syntypes (probable) HMN Case Nr22*.
Type locality: Port Jackson, low tide, NSW.

Ascidia canaliculata Heller, C. (1878). Beiträge zur nähern Kenntnis der Tunicaten. *Sber. Akad. Wiss. Wien* **77**(1): 83–109 [84–91].
Type data: type status unknown NHMW (depository uncertain, not found).
Type locality: Cape of Good Hope, South Africa.

Ascidia pyriformis Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Ascidiidae. *Proc. R. Soc. Edinb.* **10**(1): 458–472 [468].
Type data: syntypes BMNH 1887.2.4.174, 1887.2.4.175.
Type locality: Port Jackson, 12 m, NSW.

Phallusia longitubis Traustedt, M.P.A. (1882). Vestindiske Ascidiae Simplices, Forste Afdeling. Phallusiadae. *Vidensk. Meddr. Dansk Naturh. Foren.* **1881**: 257–288 [277].
Type data: holotype ZMUC*.
Type locality: St Thomas, West Indies.

Ascidia diplozoon Sluiter, C.P. (1887). Einfache Ascidien aus der Bai von Batavia. *Nat. Tijdschr. Ned. Ind.* **46**: 242–266 [249].
Type data: holotype ZMA TU224.
Type locality: Bay of Jakarta (as Djakarta), Indonesia.

Ascidia limosa Sluiter, C.P. (1887). Einfache Ascidien aus der Bai von Batavia. *Nat. Tijdschr. Ned. Ind.* **46**: 242–266 [257].
Type data: lectotype ZMA TU245.
Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [162].
Type locality: Bay of Jakarta (as Djakarta), 16–20 m, Indonesia.

Ascidia divisa Sluiter, C.P. (1898). Beiträge zur Kenntnis dei Fauna von Südafrica II. Tunicaten. *Zool. Jahrb. Syst.* **11**: 1–64 [43] [=*Ascidia canaliculata* Heller: Sluiter, 1885: 176].
Type data: type status unknown ZMA (depository uncertain, not found).
Type locality: between Mendano Is. and Billiton, Indonesia.

Ascidia incerta Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [446] [*nom. nud.*].

Ascidia incerta Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [11].
Type data: holotype AM U135 (G2088).
Type locality: Port Jackson, NSW.

Ascidia bisulca Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [43].
Type data: holotype ZMA TU267.3.
Type locality: Anchorage off Kilsuin, W coast of Kur Is., 20–45 m, Indonesia.

Ascidia donnani Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [303].
Type data: holotype BMNH*.
Type locality: Novakaddu Paar, Gulf of Manaar, Sri Lanka.

Taxonomic decision for synonymy: Hartmeyer, R. & Michaelsen, W. (1928). Ascidiae Diktyobranchiae und Ptychobranchiae. *Fauna Südwest-Aust.* **5**: 251–460 [285]; Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [54].

Distribution: Japan, South Africa; circumaustralian, QLD, NSW, VIC, SA, TAS, WA, NT, west Pacific Ocean, west Indian Ocean, Atlantic Ocean.
Ecology: benthic, marine, mud bottom, sand bottom, silt bottom.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ascidia thompsoni Kott, 1952

Ascidia thompsoni Kott, P. (1952). Ascidians of Australia. 1. Stolidobranchiata and Phlebobranchiata. *Aust. J. Mar. Freshwat. Res.* **3**(3): 206–333 [312].
Type data: holotype AM Y1668.
Type locality: Great Taylor Bay, 9 m, TAS.

Distribution: SA (S Gulfs coast), TAS (Tas. coast).
Ecology: benthic, marine.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ascidiella Roule, 1883

Ascidiella Roule, L. (1883). Sur la faune des Phallusiadées ascidies des côtes de Provence. *Compt. Rend. Acad. Sci. Paris* **97**: 1014–1016 [1015].
Type species: *Ascidia cristata* Risso, 1826 (= *Ascidia aspersa*, Mueller 1776, see Hartmeyer, R. (1915). Ascidiarum nomina conservanda. pp. 247–258 *in* Apstein, C. Nomina Conservanda. *Sber. Ges. Naturf. Freunde Berl.* **1915b**: 247–258) by original designation.

Extralimital distribution: Palaearctic Region; Mediterranean Sea, northeast Atlantic Ocean. See: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ascidiella aspersa (Mueller, 1776)

Ascidia aspersa Mueller, O.F. (1776). pp. 224–226 *in, Zoologiae Danicae*. Copenhagen : Prodromus. [225].
Type data: type status unknown.
Type locality: Adriatic Sea.

Ascidia patula Mueller, O.F. (1776). pp. 224–226 *in, Zoologiae Danicae*. Copenhagen : Prodromus. [225].
Type data: type status unknown.
Type locality: Christiana Fjord, Norway.

Ascidia scabra Mueller, O.F. (1776). pp. 224–226 *in, Zoologiae Danicae*. Copenhagen : Prodromus. [225].
Type data: type status unknown.
Type locality: Adriatic Sea.

Ascidia cristata Risso, A. (1826). *Histoire naturelle des principales productions de l'Europe méridionale.* Vol. 4. Paris & Strasbourg pp. 273–285. [276].
Type data: type status unknown.
Type locality: Adriatic Sea, see Roule, L. (1884). Recherches sur les ascidies simples des côtes de Provence 1. Phallusiadées. *Ann. Mus. Hist. Nat. Marseille* **2**(1): 1–270.

Ascidia pedunculata Hoffman, F. (1829). Einige Bemerkungen über die Vegetation und die fauna von Helgoland. *Sber. Ges. Naturf. Freunde Berl.* **1**: 228–260 [242].
Type data: type status unknown.
Type locality: Denmark.

Ascidia opalina Macgillivray, W. (1843). *A History of the Molluscous Animals of the Counties of Aberdeen, Kincardine and Banff.* London and Aberdeen : Cunnungham and Mortimer pp. 307–314 [312].
Type data: type status unknown.
Type locality: Aberdeen, Scotland.

Ascidia albida Alder, J. & Hancock, A. (1848). Tunicata in Catalogue of the Mollusca of Northumberland and Durham. *Transactions of the Tyneside Field Club* **1**: 195–207 [200] [dated 1846-1850].
Type data: type status and whereabouts unknown.
Type locality: Cullercoats, Northumberland, England.

Ascidia elliptica Alder, J. & Hancock, A. (1848). Tunicata in Catalogue of the Mollusca of Northumberland and Durham. *Transactions of the Tyneside Field Club* **1**: 195–207 [201] [dated 1846-1850].
Type data: syntypes HMN*.
Type locality: Cullercoats, Northumberland, England.

Ascidia pellucida Alder, J. & Hancock, A. (1848). Tunicata in Catalogue of the Mollusca of Northumberland and Durham. *Transactions of the Tyneside Field Club* **1**: 195–207 [202] [dated 1846-1850].
Type data: holotype HMN*.
Type locality: Cullercoats, Northumberland, England.

Ascidia sordida Alder, J. & Hancock, A. (1848). Tunicata in Catalogue of the Mollusca of Northumberland and Durham. *Transactions of the Tyneside Field Club* **1**: 195–207 [199] [dated 1846-1850].
Type data: holotype HMN*.
Type locality: Cullercoats, Northumberland, England.

Ascidia aculeata Alder, J. (1863). Observations on the British Tunicata with descriptions of several new species. *Ann. Mag. Nat. Hist. (3)***11**: 153–173 [156].
Type data: syntypes HMN*.
Type locality: Lamlash Bay, Arran, Scotland and Bantry Bay, SW Ireland.

Ascidia pustulosa Alder, J. (1863). Observations on the British Tunicata with descriptions of several new species. *Ann. Mag. Nat. Hist. (3)***11**: 153–173 [154].
Type data: holotype HMN*.
Type locality: Fowey Harbour, Cornwall, England.

Ascidia affinis Hancock, A. (1870). On the larval state of *Molgula* with a description of several new species of simple ascidians. *Ann. Mag. Nat. Hist. (4)***6**: 353–368 [361].
Type data: holotype HMN*, paratype(s) BMNH 88.5.7.261*.
Type locality: Roach River, Essex, England.

Ascidia normanni Alder, J. & Hancock, A. *in* Hancock, A. (1870). On the larval state of *Molgula*; with descriptions of several new species of simple ascidians. *Ann. Mag. Nat. Hist. (4)***6**: 353–368 [361].
Type data: holotype BMNH 98.5.7.272*.
Type locality: Strangford Lough.

Ascidia trianularis Herdman, W.A. (1881). Notes on the British Tunicata with descriptions of new species. *Proc. Linn. Soc. Lond.* **15**: 274–290.
Type data: type status and whereabouts unknown.
Type locality: Firth of Clyde, Scottland.

Ascidia truncata Herdman, W.A. (1881). Notes on the British Tunicata with descriptions of new species. *Proc. Linn. Soc. Lond.* **15**: 274–290 [280].
Type data: type status unknown.
Type locality: Firth of Clyde, Scotland.

Ascidia expansa Kiaer, J. (1893). Oversight över Norges ascidiae simplices. *Forh. Vidensk. Selsk. Krist.* **9**: 1–105 [26].
Type data: type status and whereabouts unknown.
Type locality: Bergen, Norway.

Ascidia minuta Kiaer, J. (1893). Oversight över Norges ascidiae simplices. *Forh. Vidensk. Selsk. Krist.* **9**: 1–105.
Type data: type status and whereabouts unknown.
Type locality: Aure, Norway.

Taxonomic decision for synonymy: Roule, L. (1884). Recherches sur les ascidies simples des côtes de Provence 1. Phallusiadées. *Ann. Mus. Hist. Nat. Marseille* **2**(1): 1–270 [220]; Hartmeyer, R. (1915). Alder und Hancock's Britische Tunicaten. Eine Revision. *Mitt. Zool. Mus. Berl.* **7**: 303–344 [320]; Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275 [81].

Distribution: Ireland, New Zealand, TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Lower W coast, SW coast); Mediterranean Sea, English Channel, Irish Sea, west coast of Ireland and Scotland.
Ecology: benthic, marine.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Phallusia Savigny, 1816

Phallusia Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. *In Mémoires sur les Animaux sans Vertèbres,* Pt 2. Paris : G. Dufour. [101].
Type species: *Ascidia mammillata* Cuvier, 1815 by original designation.

Pachychlaena Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Ascidiidae. *Proc. R. Soc. Edinb.* **10**(1): 458–472 [461] [introduced as a subgenus of *Ascidia*].
Type species: *Ascidia (Pachychlaena) oblonga* Herdman, 1880 by original designation.

Phallusiopsis Hartmeyer, R. (1908). Zur Terminologie der Familien und Gattungen der Ascidien. *Zool. Annln.* **3**: 1–63 [14].
Type species: *Phallusia nigra* Savigny, 1816 by original designation.

Plurascidia Monniot, F. & Monniot, C. (2000). Ascidiacea: Plurellidae collected in the Pacific Ocean by the cruises MUSORSTOM, KARUBAR and the "Coral Reef Research Foundation". *In* Crosnier, A. (ed.) Résultats des Campagnes MUSORSTOM, Volume 21. *Mémoires du Muséum National d'Histoire Naturelle*, *Paris,* **184** pp. 703–721 [714].

Type species: *Plurascidia marquesana* F. & C. Monniot, 2000 by original designation.

Taxonomic decision for synonymy: Hartmeyer, R. (1909). Ascidien (continuation of work by Seeliger). pp. 1281–1488 *in* Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs.* Leipzig : C.F. Winter Vol. 3, suppl. pts 81–87 [1403]; Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1631] (*Plurascidia*).

Extralimital distribution: Afrotropical Region; Mediterranean Sea, northeast Atlantic Ocean, Indo-west Pacific Ocean. See: Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tier-geographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Phallusia arabica Savigny, 1816

Phallusia arabica Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. *In Mémoires sur les Animaux sans Vertèbres,* Pt 2. Paris : G. Dufour. [164].
Type data: type status unknown MNHP (depository uncertain, not found).
Type locality: Gulf of Suez.

Phallusia philippinensis Millar, R.H. (1975). Ascidians from the Indo-West Pacific region in the Zoological Museum, Copenhagen (Tunicata, Ascidiacea). *Steenstrupia* **3**(20): 205–336 [273].
Type data: holotype ZMUC*.
Type locality: Banda Is., Waling Cesar, 25 m, Indonesia.

Taxonomic decision for synonymy: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [63] (excepting *Phallusia julinea* Sluiter, 1915 (*sic*) and its synonyms, included erroneously on p. 61).

Distribution: Sri Lanka, Philippines, NT (N coast), QLD (Great Barrier Reef, NE coast); Gulf of Suez, Red Sea.
Ecology: benthic, marine.

Phallusia barbarica Kott, 1985

Phallusia barbarica Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [63].
Type data: holotype QM GH3086, paratype(s) QM GH2488.
Type locality: Cleveland Point, Moreton Bay, QLD.

Distribution: QLD (Central E coast).
Ecology: benthic, marine.

Phallusia julinea Sluiter, 1919

Phallusia julinea Sluiter, C.P. (1919). Ueber einige alte neue Ascidien aus dem Zoologischen Museum von Amsterdam. *Bijdr. Dierk.* **21**: 1–12 [7] [figures published separately, see Sluiter, C.P. (1919). Ueber einige alte neue Ascidien aus dem Zoologischen Museum von Amsterdam. *Bijdr. Dierk.* **21**: 1–12 (figs 1–20)].
Type data: holotype ZMA TU742.
Type locality: Java Sea, Nassi Besar Is., 20 m, Indonesia.

Distribution: Indonesia, Palau, New Caledonia, Malagasy, NT (N coast), QLD (Central E coast, NE coast), WA (N coast, NW coast).
Ecology: benthic, marine; mostly to 30 m, wedged amongst coral rubble.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Phallusia millari Kott, 1985

Phallusia millari Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [66].
Type data: holotype QM GH699, paratype(s) QM GH700.
Type locality: Abbot Bay, Euri Creek, 16 m, QLD.

Distribution: Singapore, Philippines, NT (Gulf of Carpentaria, N coast), QLD (NE coast), WA (Central W coast, Lower W coast, N coast, NW coast).
Ecology: benthic, marine; sandy mud bottom.

Phallusia obesa (Herdman, 1880)

Ascidia (Pachychlaena) obesa Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Ascidiidae. *Proc. R. Soc. Edinb.* **10**(1): 458–472 [462].
Type data: type status unknown BMNH (depository uncertain, not found).
Type locality: East Moncoeur Is., Bass Strait, 80 m, VIC.

Ascidia (Pachychlaena) oblonga Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Ascidiidae. *Proc. R. Soc. Edinb.* **10**(1): 458–472 [461].
Type data: type status unknown BMNH (depository uncertain. not found).
Type locality: East Moncoeur Is., Bass Strait, 80 m, VIC.

Ascidia phallusioides Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [446] [*nom. nud.*].

Ascidia phallusioides Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [12].
Type data: syntypes AM U136 (G2089), AM U252, AM U235, AM U259 (G2090).
Type locality: Port Jackson, 12–16 m, NSW.

Taxonomic decision for synonymy: Hartmeyer, R. & Michaelsen, W. (1928). Ascidiae Diktyobranchiae und Ptychobranchiae. *Fauna Südwest-Aust.* **5**: 251–460 [308].

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast, NE coast), SA (S Gulfs coast), VIC (Bass Strait), WA (Central W coast, Lower W coast, NW coast, SW coast).
Ecology: benthic, marine, sand bottom; harbour piles.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Phallusia polytrema (Herdman, 1906)

Ascidia polytrema Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [306].
Type data: holotype BMNH 1907.8.30.6.
Type locality: south ends of Cheval and Periya Paars, Sri Lanka.

Ascidia pandora Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [48].
Type data: holotype QM GH2045.
Type locality: Wistari Reef, 3 m, Capricorn Group, Great Barrier Reef, QLD.

Plurascidia marquesana Monniot, F. & Monniot, C. (2000). Ascidiacea: Plurellidae collected in the Pacific Ocean by the cruises MUSORSTOM, KARUBAR and the "Coral Reef Research Foundation". *In* Crosnier, A. (ed.) Résultats des Campagnes MUSORSTOM, Volume 21. *Mémoires du Muséum National d'Histoire Naturelle*, *Paris,* **184** pp. 703–721 [714].
Type data: holotype MNHP P7 Plu 2.
Type locality: Marquesas Ils, (Hiva Oa), 85–87 m [9°44.5'S 138°49.9'W].

Taxonomic decision for synonymy: Kott, P. (1998). Tunicata. pp. 51–259 *in* Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia.* Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [149]; Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1631].

Distribution: Sri Lanka, French Polynesia, QLD (Great Barrier Reef); Indian Ocean, Gulf of Manaar.
Ecology: benthic, marine.

CORELLIDAE

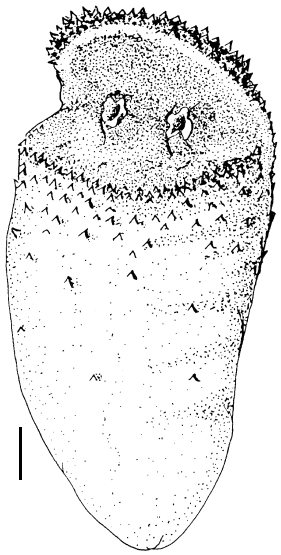

Fig. 16. *Rhodosoma turcicum* (Savigny, 1816). (Scale bar = 5.0 mm). [from Kott 1985]

The family Corellidae Herdman, 1882, in common with most phlebobranchs, contains robust ascidians with a firm gelatinous test and a large flat branchial sac. It is distinguished by the position of the gut loop and gonads in the parietal body wall to the right (rather than to the left) of the pharynx. The family is represented by two subfamilies, Corellinae Herdman, 1882 (with coiled stigmata), and Rhodosomatinae Seeliger, 1893 (with straight stigmata).

Among Corellinae, *Corella eumyota* Traustedt, 1882 is the only species presently known from Australia. It is recorded from both temperate and tropical waters. However, appreciable populations have not been detected in shallow littoral waters, although it has been found in large numbers on the sea floor around New Zealand (Kott 1969).

The only species in the subfamily Rhodosomatinae recorded from Australia, *Rhodosoma turcicum* (Savigny, 1816), is widely distributed in temperate and tropical waters of the Atlantic, Pacific and Indian Oceans and the Mediterranean Sea. Though taken from a vast latitudinal range, it has been recorded in crowded populations only in deeper (175–155 m) waters off north-eastern Tasmania. The species is readily identified by the fold that projects into the body almost completely isolating an anterior flap or lid which closes down over the apertures, the body muscles being modified to operate the lid.

References

Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Ascidiidae. *Proc. R. Soc. Edinb.* **10**(1): 458–472

Herdman, W.A. (1882). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt I, Ascidiae simplices. *Zool. Chall. Exped.* **6**(17): 1–296

Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239

Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440

Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. *In Mémoires sur les Animaux sans Vertèbres,* Pt 2. Paris : G. Dufour.

Seeliger, O. (1893). Appendicularien and Ascidien, Tunicata. Manteltiere. pp. 1–48 *in* Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs.* Leipzig : C.F. Winter Vol. 3 Suppl. 1

Traustedt, M.P.A. (1882). Vestindiske Ascidiae Simplices, Forste Afdeling. Phallusiadae. *Vidensk. Meddr. Dansk Naturh. Foren.* **1881**: 257–288

Corella Alder, 1870

Corella Alder, J. & Hancock, A. *in* Hancock, A. (1870). On the larval state of *Molgula*; with descriptions of several new species of simple ascidians. *Ann. Mag. Nat. Hist. (4)***6**: 353–368 [362].
Type species: *Ascidia parallelogramma* Mueller, 1776 by subsequent designation, see Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275.

Extralimital distribution: Antarctic Region, Palaearctic Region; northeast Pacific Ocean, tropical west Pacific Ocean, northeast Atlantic Ocean, tropical west Atlantic Ocean, Mediterranean Sea. See: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Corella eumyota Traustedt, 1882

Corella eumyota Traustedt, M.P.A. (1882). Vestindiske Ascidiae Simplices, Forste Afdeling. Phallusiadae. *Vidensk. Meddr. Dansk Naturh. Foren.* **1881**: 257–288 [271].
Type data: holotype ZMUC*.
Type locality: Valparaiso, Chile, Pacific Ocean.

Corella novarae Drasche, R. von (1884). Ueber einige neue und weniger gekannte aussereuropäische einfache Ascidien. *Denkschr. Akad. Wiss. Wien* **48**: 369–387 [382].
Type data: type status unknown.
Type locality: St Paul Is., Indian Ocean.

Corella antarctica Sluiter, C.P. (1905). Note préliminaire sur les ascidiens holosomates de l'Expédition Antarctique Française commandée par le Dr. Charcot. *Bull. Mus. Natl. Hist. Nat. Paris* **11**: 470–475 [471].
Type data: syntypes MNHP P4 COR.A 23–24*.
Type locality: Wandel Is., Antarctica.

Corella valentinae Kesteven, H.L. (1909). Studies on Tunicata no. 1. *Proc. Linn. Soc. N.S.W.* **34**: 276–295 [286].
Type data: syntypes AM U565, U566.
Type locality: Hobart Harbour, 9 m, TAS.

Corella benedeni Beneden, E. van & Sélys-Longchamps, M. (1913). Tuniciers. Caducichordata (Ascidiacés et Thaliacés). *Résult. Voyage S.Y. Belgica Zoologie* **5**(2): 1–122 [9].
Type data: type status and whereabouts unknown.
Type locality: Nasse Is., 436 m, Grahamland [71°15'S 87°44'W], see Ärnbäck-Christie-Linde, A. (1938). Ascidiacea. *Further zool. Results Swed. Antarct. Exped. 1901–1* **3**(4): 1–54.

Corella dohrni Beneden, E. van & Sélys-Longchamps, M. (1913). Tuniciers. Caducichordata (Ascidiacés et Thaliacés). *Résult. Voyage S.Y. Belgica Zoologie* **5**(2): 1–122 [15].
Type data: type status and whereabouts unknown.
Type locality: 580 m, Grahamland [70°00'S 80°48'E], see Ärnbäck-Christie-Linde, A. (1938). Ascidiacea. *Further zool. Results Swed. Antarct. Exped. 1901–1* **3**(4): 1–54.

Taxonomic decision for synonymy: Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476 [212].

Distribution: Chile, Argentina, New Zealand, South Africa, SA (S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Lower W coast); Magellanic region and Antarctic Peninsula.
Ecology: benthic, marine; sometimes in crowded populations on sea floor, also on rocks and harbour fittings.
References: Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239; Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Rhodosoma Ehrenberg, 1828

Rhodosoma Ehrenberg, C.G. (1828). Zoologica Vol. 1, Praefatio. fol. 3. *In, Symbolae Physicae* seu Icones et descriptiones corporum naturalium novorum aut minus cognitorum, quae ex itineribus per Libyam, Aegyptum, Nubium, Dongalam, Syriam, Arabiam, et Hemprich st Christiani Godofredi Ehrenberg … studio annis MDCCCXX-MDCCCXXV redierunt. Vol. 3. Berolini : Officina Academica. [3].
Type species: *Phallusia turcica* Savigny, 1816 by monotypy.

Schizascus Stimpson, W. (1855). Description of some new marine invertebrata from the Chinese and Japanese Seas. *Proc. Acad. Nat. Sci. Phila.* **7**: 377–378 [377].
Type species: *Schizascus pellucidus* Stimpson, 1855 by original designation.

Peroides Macdonald, J.D. (1864). On the representative relationships of the fixed and free Tunicata, regarded as two subclasses of equivalent value; with some general remarks on their morphology. *Trans. R. Soc. Edinburgh* **23**(2): 171–183 [179].
Type species: *Pera huxleyi* Macdonald, 1862 by monotypy.

Chevreulius Lacaze-Duthiers, F.J.H. (1865). Sur un genre nouveau d'ascidien, le *Chevreulius callensis* Lac.-Duth. *Ann. Sci. Nat. Zool. (5)***4**: 293–316 [293].
Type species: *Chevreulius callensis* Lacaze-Duthiers, 1865 by monotypy.

Corellascidia Hartmeyer, R. (1900). Nachtrag zu Monascidien von Ternate. *Abh. Senckenb. Naturforsch. Ges.* **25**(1): 235–242 [235].
Type species: *Corellascidia herdmani* Hartmeyer, 1900 by monotypy.

Taxonomic decision for synonymy: Hartmeyer, R. (1901). Zur Kenntnis des genus *Rhodosoma*. *Arch. Naturg. Suppl.* **67**: 151–168 [158]; Hartmeyer, R. & Michaelsen, W. (1928). Ascidiae Diktyobranchiae und Ptychobranchiae. *Fauna Südwest-Aust.* **5**: 251–460 [313]; Kott, P. (1998). Tunicata. pp. 51–259 *in* Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [156] (for *Peroides*).

Extralimital distribution: Palaearctic Region; pan-tropical, temperate west Pacific Ocean, temperate east Pacific Ocean, Mediterranean Sea. See: Hartmeyer, R. & Michaelsen, W. (1928). Ascidiae Diktyobranchiae und Ptychobranchiae. *Fauna Südwest-Aust.* **5**: 251–460; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Rhodosoma turcicum (Savigny, 1816)

Phallusia turcica Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. *In Mémoires sur les Animaux sans Vertèbres,* Pt 2. Paris : G. Dufour. [102].
Type data: type status unknown MNHP (depository uncertain, not found).
Type locality: Red Sea.

Rhodosoma verecundum Ehrenberg, C.G. (1828). Zoologica Vol. 1, Praefatio. fol. 3. *In, Symbolae Physicae* seu Icones et descriptiones corporum naturalium novorum aut minus cognitorum, quae ex itineribus per Libyam, Aegyptum, Nubium, Dongalam, Syriam, Arabiam, et Hemprich st Christiani Godofredi Ehrenberg … studio annis MDCCCXX-MDCCCXXV redierunt. Vol. 3. Berolini : Officina Academica. [3].
Type data: syntypes (probable) ZMB 129, 130*.
Type locality: Red Sea.

Schizascus papillosus Stimpson, W. (1855). Description of some new marine invertebrata from the Chinese and Japanese Seas. *Proc. Acad. Nat. Sci. Phila.* **7**: 377–378 [377].
Type data: type status and whereabouts unknown.
Type locality: between Gulzlaff Is. and Hsia-men, 86 m, China coast.

Schizascus pellucidus Stimpson, W. (1855). Description of some new marine invertebrata from the Chinese and Japanese Seas. *Proc. Acad. Nat. Sci. Phila.* **7**: 377–378 [377].
Type data: type status and whereabouts unknown.
Type locality: China coast.

Pera huxleyi Macdonald, J.D. (1862). On a new Tunicata occurring on one of the Bellona Reefs. *Proc. Linn. Soc. Lond.* **6**: 78–81 [78].
Type data: type status unknown.
Type locality: Bellona Reefs, New Caledonia [21°51'S 159°29'E].

Chevreulius callensis Lacaze-Duthiers, F.J.H. (1865). Sur un genre nouveau d'ascidien, le *Chevreulius callensis* Lac.-Duth. *Ann. Sci. Nat. Zool. (5)***4**: 293–316 [293].
Type data: syntypes MNHP P4 RHO3*.
Type locality: La Calle, Mediterranean Sea.

Rhodosoma seminudum Heller, C. (1878). Beiträge zur nähern Kenntnis der Tunicaten. *Sber. Akad. Wiss. Wien* **77**(1): 83–109 [89].
Type data: type status unknown NHMW (depository uncertain, not found).
Type locality: Jamaica, West Indies.

Rhodosoma pyxis Traustedt, M.P.A. (1882). Vestindiske Ascidiae Simplices, Forste Afdeling. Phallusiadae. *Vidensk. Meddr. Dansk Naturh. Foren.* **1881**: 257–288 [274].
Type data: holotype ZMUC*.
Type locality: Chile.

Corellascidia herdmani Hartmeyer, R. (1900). Nachtrag zu Monascidien von Ternate. *Abh. Senckenb. Naturforsch. Ges.* **25**(1): 235–242 [236].
Type data: holotype SMF* (depository uncertain).
Type locality: littoral, Ternate, Indonesia.

Rhodosoma ceylonicum Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [302].
Type data: holotype BMNH 1907.8.30.4.
Type locality: Palk Bay, Sri Lanka.

Taxonomic decision for synonymy: Hartmeyer, R. & Michaelsen, W. (1928). Ascidiae Diktyobranchiae und Ptychobranchiae. *Fauna Südwest-Aust.* **5**: 251–460 [313].

Distribution: Philippines, Indonesia, China (People's Republic), Chile, Japan, California, NSW (Central E coast, Lower E coast), NT (N coast), QLD (Central E coast, NE coast), SA (Great Australian Bight, S Gulfs coast), WA (Lower W coast, N coast, NW coast); Coral Sea, Indian Ocean, Red Sea, Mediterranean, Atlantic Ocean.
Ecology: benthic, marine; generally in shallow water, but taken in large numbers off NE Tasmania at 174–155 m.
References: Hartmeyer, R. (1901). Zur Kenntnis des genus *Rhodosoma*. *Arch. Naturg. Suppl.* **67**: 151–168; Kott, P. (1954). Tunicata, Ascidians. *Rep. B.A.N.Z. Antarct. Res. Exped.* **1**(4): 121–182; Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

PEROPHORIDAE

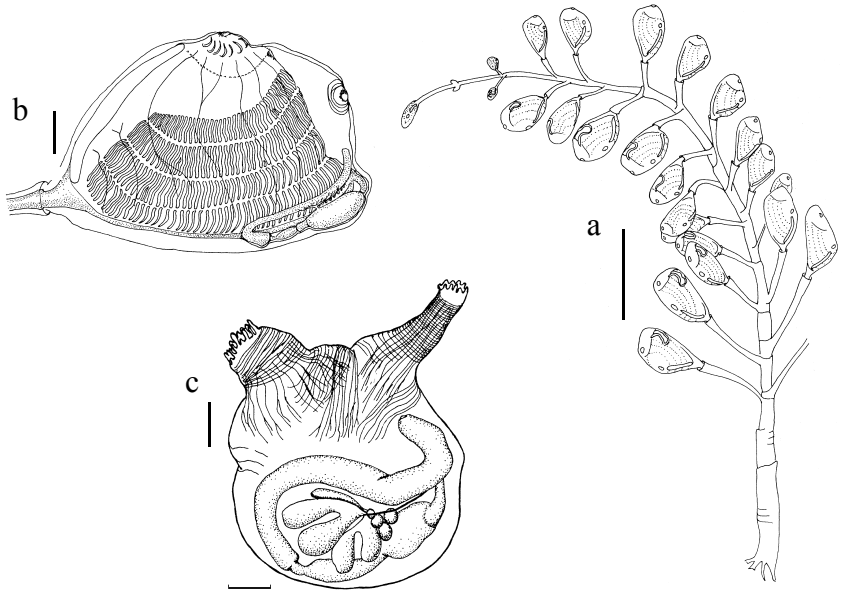

Fig. 17. **a**, **b**, *Perophora namei* Hartmeyer & Michaelsen, 1928, colony and contracted zooid removed from test; **c**, *Perophora multistigmata* Kott, 1952, zooid test. (Scale bars: a = 5.0 mm; b = 0.5 mm; c = 0.2 mm). [from Kott 1985]

Species of the family Perophoridae Giard, 1872 are colonies in which small zooids develop from the mesodermal tissue in the vessels of the thin axial or basal stolons which connect them to one another. The gut loop is to the left of the flat branchial sac, and internal longitudinal vessels and from four to 25 rows of stigmata are in the branchial sac. The apertures have up to 14 lobes around each rim. Gonads are in the gut loop. The ovary is small and sac-like. The testis is undivided or lobed or divided into up to ten long club-shaped follicles (*Perophora* Wiegmann, 1835); or it is a mass of small pyriform or branched follicles (*Ecteinascidia* Herdman, 1880). The genus *Perophora* has been revised by Goodbody (1994).

Embryos are incubated in a brood pouch in the parietal body wall. They are large with ocellus and otolith and antero-median adhesive organs with axillary cones in ectodermal cups like aplousobranch ascidians. The aplousobranch-like viviparous larvae of Perophoridae and the role of the mesodermal tissue in the replicative process has led Berrill (1950) to postulate a clavelinid rather than phlebobranch affinity for the family. The proposal is supported by the fact that an epicardium has not been detected. However, nor have traces of phlebobranch nephrocytes or excretory vesicles been found around the gut or elsewhere in the body wall. Nevertheless, the gut loop in the parietal body wall, the gonads enclosed in the gut loop and the form of the pharynx are all significant phlebobranch characters and arguments for a phlebobranch affinity appear to be the most compelling. The aplousobranch-like appearance of the larval trunk probably is the result of convergence associated with viviparity, for the

sessile adhesive organs are only superficially similar to the stalked ones of aplousobranch species. A viviparous habit occurs in most colonial ascidians, and appears to be adaptive rather than indicative of a phylogenetic relationship.

The family is well represented in Australian waters by eight species of the exclusively tropical genus *Ecteinascidia* and six species of *Perophora*, a genus known from both tropical and temperate waters. *Perophora hutchisoni* is one of the few known trans-Tasman species. Kott (1985, 2003) has documented the Australian members of the family and reviewed its affinities.

References

Berrill, N.J. (1950). The Tunicata. *Ray Soc. Publs* **133**: 1–354

Giard, A.M. (1872). Recherches sur les ascidies composées ou synascidies. *Arch. Zool. Exp. Gén.* **1**: 613–662

Goodbody, I. (1994). The tropical western Atlantic Perophoridae (Ascidiacea): 1. The genus *Perophora*. *Bull. Mar. Sci* **55**(1): 176–192

Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Part 2. Ascidiidae. *Proc. R. Soc. Edinb.* **10**: 714–726

Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440

Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653

Wiegmann, A.F.A. (1835). Tunicata. *Arch Naturg.* **1**(1): 309

Ecteinascidia Herdman, 1880

Ecteinascidia Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Part 2. Ascidiidae. *Proc. R. Soc. Edinb.* **10**: 714–726 [722].
Type species: *Ecteinascidia turbinata* Herdman, 1880 by subsequent designation, see Beneden, E. van (1887). Les genres *Ecteinascidia* Herd., *Rhopalaea* Phil. et *Sluiteria* n.g. Note pour servir à la classification des Tuniciers. *Bull. Acad. R. Belg. Cl. Sci. (3)***14**(7): 19–44.

Sluiteria Beneden, E. van (1887). Les genres *Ecteinascidia* Herd., *Rhopalaea* Phil. et *Sluiteria* n.g. Note pour servir à la classification des Tuniciers. *Bull. Acad. R. Belg. Cl. Sci. (3)***14**(7): 19–44 [33].
Type species: *Ecteinascidia rubricollis* Sluiter, 1885 by monotypy.

Perophoropsis Lahille, F. (1890). *Recherches sur les tuniciers des côtes de France.* Toulouse : Lagarde et Sebille 330 pp. [286].
Type species: *Perophoropsis herdmani* Lahille, 1890 by monotypy.

Taxonomic decision for synonymy: Berrill, N.J. (1950). The Tunicata. *Ray Soc. Publs* **133**: 1–354 [141].

Extralimital distribution: tropical Indo-west Pacific Ocean, tropical Atlantic Ocean, Mediterranean Sea. See: Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Berrill, N.J. (1950). The Tunicata. *Ray Soc. Publs* **133**: 1–354; Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ecteinascidia diaphanis Sluiter, 1885

Ecteinascidia diaphanis Sluiter, C.P. (1885). Ueber einige einfachen Ascidien von der Insel Billiton. *Nat. Tijdschr. Ned. Ind.* **45**: 160–232 [168].
Type data: holotype ZMA TU524.
Type locality: between Mendanau and Billiton, 12 m, Indonesia, see Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200.

Ecteinascidia hataii Tokioka, T. (1950). Ascidians from the Palao Is. I. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **1**(3): 115–150 [127] [publication date established from Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl Mus.* **251**: 1–242].
Type data: type status unknown SMBL (depository uncertain, not found).
Type locality: Palau Is., W Pacific Ocean.

Ecteinascidia koumaci Monniot, C. (1987). Ascidies de Nouvelle-Calédonie I. Phlebobranches du Lagon. *Bull. Mus. Natl. Hist. Nat. Paris (4)***9A**(1): 3–31 [28].
Type data: holotype MNHP P2 ECT 41*, paratype(s) MNHP P2 ECT 42*.
Type locality: Passe de Koumac, lagoon, New Caledonia.

Ecteinascidia ndouae Monniot, C. (1991). Ascidies de Nouvelle-Calédonie VIII. Phlébobranches (suite). *Bull. Mus. Natl. Hist. Nat. Paris (4)***12A**(3–4): 491–515 [505].
Type data: holotype MNHP P2 ECT 49*.
Type locality: Cape N'Dona, south of la Grande Terre, New Caledonia.

Taxonomic decision for synonymy: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [90]; Kott, P. (1992). The Australian Ascidiacea, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655 [635].

Distribution: Palau, New Caledonia, NSW (Central E coast), NT (N coast), QLD (Central E coast, Great Barrier Reef); west Pacific Ocean.
Ecology: benthic, marine; under-surface of boulders, under ledges.

Ecteinascidia flora Kott, 1952

Ecteinascidia flora Kott, P. (1952). Ascidians of Australia. 1. Stolidobranchiata and Phlebobranchiata. *Aust. J. Mar. Freshwat. Res.* **3**(3): 206–333 [316].
Type data: syntypes AM U3903, U3970.
Type locality: 28°03´S 113°E, 35 m, WA.

Distribution: WA (Lower W coast); known only from type locality.
Ecology: benthic, marine.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ecteinascidia imperfecta Tokioka, 1950

Ecteinascidia imperfecta Tokioka, T. (1950). Ascidians from the Palao Is. I. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **1**(3): 115–150 [129] [publication date established from Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl Mus.* **251**: 1–242].
Type data: type status unknown SMBL (depository uncertain, not found).
Type locality: Palau Is., W Pacific Ocean.

Ecteinascidia remanea Monniot, F. & Monniot, C. (2001). Ascidians from the tropical western Pacific. *Zoosystema* **23**(2): 201–383 [302].
Type data: holotype MNHP P2 ECT 83.
Type locality: Shrimp Lake, marine lake on E side Ngeruktabel Island, Ngeremdiu, mangrove roots/carbonate rock, 1 m, Palau Is. [7°15.27'N 134°26.68'E].

Taxonomic decision for synonymy: Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1636].

Distribution: Palau, QLD (Great Barrier Reef); Korror.
Ecology: benthic, marine.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [92].

Ecteinascidia maxima Kott, 1985

Ecteinascidia maxima Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [93].
Type data: holotype QM GH50.
Type locality: reef, Sugarloaf, Lord Howe Is., 17 m.

Distribution: Lord Howe Island, NSW (SE oceanic); known only from type locality.
Ecology: benthic, marine; reef.

Ecteinascidia nexa Sluiter, 1904

Ecteinascidia nexa Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [11].
Type data: syntypes ZMA TU558.5.
Type locality: reef, Karkaralong Group, Indonesia.

Eteinascidia hornelli Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [298].
Type data: type status unknown BMNH (depository uncertain, not found).
Type locality: Navakaddu Paar, south part of Gulf of Manaar, 16 m, India.

Ecteinascidia tokaraensis Tokioka, T. (1954). Contributions to Japanese ascidian fauna VII. Invertebrate fauna of the intertidal zone of the Tokara Islands. VII Ascidians. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **3**(3): 239–264 [255].
Type data: holotype SMBL 138*.
Type locality: Takarazima, Tokara Is., Japan.

Ecteinascidia aequale Monniot, C. (1987). Ascidies de Nouvelle-Calédonie I. Phlebobranches du Lagon. *Bull. Mus. Natl. Hist. Nat. Paris (4)***9A**(1): 3–31 [25].
Type data: holotype MNHP P2 ECT.43*.
Type locality: lagoon, New Caledonia.

Taxonomic decision for synonymy: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [94]; Kott, P. (1992). The Australian Ascidiacea, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655 [635].

Distribution: Sri Lanka, Philippines, Indonesia, Solomon Islands, New Caledonia, Fiji, Lord Howe Island, QLD (Great Barrier Reef, NE coast, SE oceanic); west Pacific Ocean and Indian Ocean, Tokara Ils.
Ecology: benthic, marine; common under rubble at low tide.

Ecteinascidia rubricollis Sluiter, 1885

Ecteinascidia rubricollis Sluiter, C.P. (1885). Ueber einige einfachen Ascidien von der Insel Billiton. *Nat. Tijdschr. Ned. Ind.* **45**: 160–232 [163].
Type data: holotype ZMA TU978.
Type locality: Billiton, 12 m, Indonesia, see Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200.

Ecteinascidia koumaci Monniot, C. (1987). Ascidies de Nouvelle-Calédonie I. Phlebobranches du Lagon. *Bull. Mus. Natl. Hist. Nat. Paris (4)***9A**(1): 3–31 [28].

Type data: holotype MNHP P2 ECT 41*, paratype(s) MNHP P2 ECT 42*.
Type locality: Passe de Koumac, lagoon, New Caledonia.

Taxonomic decision for synonymy: Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1637].

Distribution: Indonesia, New Caledonia, Mozambique, QLD (Great Barrier Reef, NE coast).
Ecology: benthic, marine.

Ecteinascidia sluiteri Herdman, 1906

Ecteinascidia sluiteri Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [300].
Type data: holotype BMNH 1907.8.30.2.
Type locality: off north end Karativo Is., 20–50 m, Sri Lanka.

Ecteinascidia vitta Monniot, C. (1992). Ascidies de Nouvelle-Calédonie XI. Phlebobranches et Stolidobranches du Plateau des Chesterfield. *Bull. Mus. Natl. Hist. Nat. Paris (4)***14A**(1): 3–22 [10].
Type data: holotype MNHP P2 ECT54.
Type locality: Chalcal, Chesterfield Is., Coral Sea.

Taxonomic decision for synonymy: Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1639].

Distribution: Sri Lanka, Singapore, Palau, New Caledonia, Federated States of Micronesia, Mozambique, NT (N coast), QLD (Great Barrier Reef, NE coast).
Ecology: benthic, marine; on rubble at low tide, often with epibionts.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Ecteinascidia thurstoni Herdman, 1890

Ecteinascidia thurstoni Herdman, W.A. (1890). On the genus *Ecteinascidia* and its relations; with descriptions of two new species, and a classification of the family Clavelinidae. *Proc. Trans. Liverpool Biol. Soc.* **5**: 144–163 [151].
Type data: syntypes MAD W.18/7 (Zoology, Invertebrate Gallery).
Type locality: Pearl Banks, Gulf of Manaar.

Distribution: Sri Lanka, South Africa, WA (Lower W coast, NW coast); Gulf of Manaar, Gulf of Aden, Gulf of Suez.
Ecology: benthic, marine.
Reference: Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1640].

Perophora Wiegmann, 1835

Perophora Wiegmann, A.F.A. (1835). Tunicata. *Arch Naturg.* **1**(1): 309 [309] [without included species].

Type species: *Perophora listeri* Forbes, 1848 by subsequent monotypy, see Forbes, E. & Hanley, S.C.T. (1952). *A History of British Mollusca and their Shells.* (1848–1952). London : John van Voorst Vol. 1,2 & 4 (appendix) pp. 1–54, 369–376, 244–246 [28].

Extralimital distribution: tropical west Pacific Ocean to Japan, north-east Pacific Ocean, tropical west Atlantic Ocean, east Atlantic Ocean, Mediterranean Sea. See: Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Berrill, N.J. (1950). The Tunicata. *Ray Soc. Publs* **133**: 1–354; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Perophora clavata Kott, 1985

Perophora clavata Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [102].
Type data: holotype QM G12732.
Type locality: 2 km off Ninety Mile Beach, Bass Strait, 17 m, VIC.

Distribution: VIC (Bass Strait); known only from type locality.
Ecology: benthic, marine.

Perophora hutchisoni Macdonald, 1859

Perophora hutchisoni Macdonald, J.D. (1859). On the anatomical characters of an Australian species of *Perophora*. *Trans. Linn. Soc. Lond.* **22**: 377–379 [377].
Type data: type status unknown.
Type locality: King Georges Sound, Albany, SW WA.

Perophora boltenina Michaelsen, W. (1922). Ascidiae Ptychobranchiae und Diktyobranchiae von Neusseeland und dem Chatham-Inseln. Papers from Dr. Th. Mortensen's Pacific Expedition 1914–1916, XI. *Vidensk. Meddr. Dansk Naturh. Foren.* **73**: 359–498 [488].
Type data: holotype ZMUC*.
Type locality: Stewart Is., 70 m, New Zealand.

Taxonomic decision for synonymy: Hartmeyer, R. & Michaelsen, W. (1928). Ascidiae Diktyobranchiae und Ptychobranchiae. *Fauna Südwest-Aust.* **5**: 251–460 [269].

Distribution: New Zealand, TAS (Tas. coast), VIC (Bass Strait), WA (Lower W coast, SW coast).
Ecology: benthic, marine, sand bottom; 5–20 m subject to heavy surge and sand scour.
References: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [103]; Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1633].

Perophora longicaulis Kott, 2003

Perophora longicaulis Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1633].
Type data: holotype WAM 206.87.
Type locality: SW Long Is., 18 m, Wallabi Group, Houtman's Abrolhos, WA.

Distribution: WA (Lower W coast); known only from type locality.
Ecology: benthic, marine.

Perophora modificata Kott, 1985

Perophora modificata Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [104].
Type data: holotype QM GH283.
Type locality: channel face, Deltaic Reef, northern Great Barrier reef, QLD.

Distribution: Philippines, Palau, New Caledonia, NT (N coast), QLD (Great Barrier Reef, NE oceanic); NE oceanic (Lihou Reef).
Ecology: benthic, marine; 17–27 m, channel faces or in lagoons.
Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [41].

Perophora multiclathrata (Sluiter, 1904)

Ecteinascidia multiclathrata Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [12].
Type data: holotype ZMA TU558.4.
Type locality: reef, Nusalaut Is., Indonesia.

Ecteinascidia formosana Oka, A. (1931). Ueber eine neue species von *Ecteinascidia* aus Formosa. *Proc. Imp. Acad. Japan* **7**: 173–175 [173].
Type data: syntypes BLIH 203*.
Type locality: Hoko-kô, Taiwan (as Formosa).

Perophora orientalis Ärnbäck-Christie-Linde, A. (1935). A notable case of relation in *Perophora*. *Ark. Zool.* **28B**(9): 1–6 [6].
Type data: syntypes NHRM 1496*.
Type locality: Misaki Biological Station, Japan.

Perophora africana Millar, R.H. (1955). On a collection of ascidians from the Gold Coast. *Proc. Zool. Soc. Lond.* **123**(11): 277–325 [304].
Type data: holotype BMNH 1959.5.27.10*.
Type locality: Dix Cove Shore, Gold Coast, W Africa.

Taxonomic decision for synonymy: Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl Mus.* **251**: 1–242 [136]; Nishikawa, T. (1984). Ascidians from the Truk Islands, Ponape Island, and Majuro Atoll (Tunicata, Ascidiacea). *Proc. Jpn. Soc. Syst. Zool.* **27**: 107–140 [123]; Nishikawa, T. (1986). Ascidians from the Gilbert and Solomon Islands and Nauru. I. Perophoridae, Ascidiidae, Corellidae. *Int. Sci. Rev.* **32**: 1–78 4 maps [31]; Kott, P. (1992). The Australian Ascidiacea, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655 [635].

Distribution: Japan, NSW (Central E coast, Lower E coast), QLD (Central E coast, Great Barrier Reef, NE coast), WA (Lower W coast); west Pacific Ocean, tropical Atlantic Ocean and west Indian Ocean.
Ecology: benthic, marine; shallow depths, rubble and shells, epizoic on other ascidians, under stones with good water circulation.

Perophora multistigmata Kott, 1952

Perophora multistigmata Kott, P. (1952). Ascidians of Australia. 1. Stolidobranchiata and Phlebobranchiata. *Aust. J. Mar. Freshwat. Res.* **3**(3): 206–333 [313].
Type data: syntypes AM U3904, AM U3969.
Type locality: Dunwich, Moreton Bay, QLD.

Distribution: QLD (Central E coast); known only from type locality.
Ecology: benthic, marine.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [108].

Perophora namei Hartmeyer & Michaelsen, 1928

Perophora namei Hartmeyer, R. & Michaelsen, W. (1928). Ascidiae Diktyobranchiae und Ptychobranchiae. *Fauna Südwest-Aust.* **5**: 251–460 [270].
Type data: holotype USNM 5926*.
Type locality: near Zamboanga Light, Mindadas, 20 m, Philippines.

Distribution: Philippines, QLD (NE oceanic).
Ecology: benthic, marine; 26 m, base of drop off on front reef near sandy bottom, common on vertical surface of dead coral.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [108].

Perophora sabulosa Kott, 1990

Perophora sabulosa Kott, P. (1990). The Australian Ascidiacea, Phlebobranchia and Stolidobranchia, supplement. *Mem. Queensl. Mus.* **29**(1): 267–298 [267].
Type data: holotype QM GH3894, paratype(s) QM GH3902, GH4265.
Type locality: off Dunwich, Moreton Bay, 6 m, QLD.

Distribution: QLD (Central E coast).
Ecology: benthic, marine; in rock crevices, high in intertidal zone in rock outcrops on sandy beach.

PLURELLIDAE

Fig. 18. *Plurella elongata* Kott, 1973, portion of zooid in test. (Scale bar = 1.0 mm).
[from Kott 1985]

In the family Plurellidae Kott, 1973, parts of the body wall along the dorsal mid-line, both anterior and posterior to the atrial aperture and including the neural complex and the gonads, are embedded in the test. Ovary and testis are separate, the undivided testis being embedded near the posterior end of the body, and the ovaries around the base of the atrial siphon. An arc of the body wall around the ventral border of the gut loop to the left of the mid-ventral line, containing the heart, is also embedded in the test. The duct of the neural gland, embedded in the test between the atrial and branchial apertures, opens into the atrial cavity by numerous simple ciliated pits along its length.

In the genus *Plurella* Kott, 1973, the male duct divides into distal branches, each expanded into a seminal vesicle to open with the separate short, wide, almost sessile oviducal openings of about six ovarian sacs arranged around the posterior rim of the base of the atrial siphon. *Microgastra* Kott, 1985 has only one ovarian sac and the vas deferens does not divide distally.

In both colonial *Plurella* and solitary *Microgastra* the test is sandy, hard and sometimes brittle, and the very thin body wall generally has few and delicate transverse muscles in a short band down the right side. The body musculature closely resembles and is probably convergent with that of *Ascidia scaevola* (Sluiter, 1904) which shares the characteristically brittle test of the solitary plurellids, *Microgastra* spp. Also, the right side of the body is narrower than the left and it has a fold of the branchial sac on the right side of the body resembling that of *A. scaevola*.

Plurella is known from four species, three tropical (*Plurella kottae* Monniot. F. & C., 1996, *P. monogyna* Monniot, F. & C., 2000, and *P. testacea* Monniot, F. & C., 2000) from the Philippines) and one temperate Australian species (*P. elongata* Kott, 1973). *Microgastra* is known from one species, common on sandy substrates from Bowen to Indonesia, Sri Lanka and Japan (Kott 1990).

References

Kott, P. (1973). Plurellidae, a new phlebobranchiate family of the Ascidiacea. *Proc. Linn. Soc. Lond.* **97**(4): 258–261

Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440

Kott, P. (1990). The Australian Ascidiacea, Phlebobranchia and Stolidobranchia, supplement. *Mem. Queensl. Mus.* **29**(1): 267–298

Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279

Monniot, F. & Monniot, C. (2000). Ascidiacea: Plurellidae collected in the Pacific Ocean by the cruises MUSORSTOM, KARUBAR and the "Coral Reef Research Foundation". *In* Crosnier, A. (ed.) Résultats des Campagnes MUSORSTOM, Volume 21. *Mémoires du Muséum National d'Histoire Naturelle*, *Paris,* **184** pp. 703–721

Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126

Microgastra Kott, 1985

Microgastra Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [70].
Type species: *Ascidia granosa* Sluiter, 1904 by original designation.

Extralimital distribution: See: Kott, P. (1990). The Australian Ascidiacea, Phlebobranchia and Stolidobranchia, supplement. *Mem. Queensl. Mus.* **29**(1): 267–298.

Microgastra granosa (Sluiter, 1904)

Ascidia granosa Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [36].
Type data: holotype ZMA TU267.8.
Type locality: 8°30´S 119°07´E, 73 m, Indonesia.

Ascidia lapidosa Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [32].
Type data: syntypes ZMA TU240, TU241, TU242, TU243.
Type locality: 27–54 m, Damar Is., 45 m; reef, Waru-bai, Seram; reef Banda Is., Indonesia [8°25'12"S 127°18'24"E].

Ascidia mikrenterica Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [37].
Type data: syntypes ZMA TU254.
Type locality: 204 m, Indonesia [5°28'24"S 132°00'12"E].

Ascidia aenigmatica Nishikawa, T. (1986). Some ascidians dredged around the Oki Islands, the Japan Sea. *Mem. Natl. Sci. Mus. (Tokyo)* **19**: 175–188 [177].
Type data: holotype SMBL 339*, paratype(s) NSMT Pc683*.
Type locality: off SW coast, Dogo Is., Oki, Japan Sea.
Taxonomic decision for synonymy: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 [70]; Kott, P. (1990). The Australian Ascidiacea, Phlebobranchia and Stolidobranchia, supplement. *Mem. Queensl. Mus.* **29**(1): 267–298 [267].

Distribution: Sri Lanka, Japan, Indonesia, QLD (Central E coast, NE coast).
Ecology: benthic, marine; loose coral, sandy substrate, at about 6 m.

Plurella Kott, 1973

Plurella Kott, P. (1973). Plurellidae, a new phlebobranchiate family of the Ascidiacea. *Proc. Linn. Soc. Lond.* **97**(4): 258–261 [258].
Type species: *Plurella elongata* Kott, 1973 by original designation.

Extralimital distribution: west Pacific Ocean. See: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

Plurella elongata Kott, 1973

Plurella elongata Kott, P. (1973). Plurellidae, a new phlebobranchiate family of the Ascidiacea. *Proc. Linn. Soc. Lond.* **97**(4): 258–261 [258].
Type data: holotype NMV 164, paratype(s) NMV 165, 166.
Type locality: Investigator Strait, SA.

Distribution: SA (S Gulfs coast), VIC (Bass Strait), WA (Lower W coast).
Ecology: benthic, marine; to 92 m in sandy habitats.
Reference: Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440.

UNPLACED SPECIES

The following names cannot be placed with certainty, for reasons given below, and are listed as *Species Inquirendae*.

Species Inquirenda

Ascidia aurora Quoy, J.R.C. & Gaimard, J.P. (1834). Zoologie, Mollusques pp. 559–626. *in, Voyages de découvertes de l'*Astrolabe *1826–1829,* Vol. 3. Paris : Pilet Ainé. [605] [described as 'aurore un peu foncé avec des bandes verticales violettes se portant sur les tubes'; it may be a specimen of *Pyura robusta* Hartmeyer, 1922, which has radial tracts of overlapping iridescent spines from the siphons down the sides of the body and which on one occasion has been described as brick red with black oral siphons (see Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440); at this stage, more living specimens need to be observed to confirm its identity].
Type data: holotype whereabouts unknown.
Type locality: Western Port, VIC.

Ascidia reticulata Quoy, J.R.C. & Gaimard, J.P. (1834). Zoologie, Mollusques pp. 559–626. *in, Voyages de découvertes de l'*Astrolabe *1826–1829,* Vol. 3. Paris : Pilet Ainé. [606] [neither the species nor the genus is evident from the original description].
Type data: holotype whereabouts unknown.
Type locality: King Georges Sound, WA.

Ascidia tumulus Quoy, J.R.C. & Gaimard, J.P. (1834). Zoologie, Mollusques pp. 559–626. *in, Voyages de découvertes de l'*Astrolabe *1826–1829,* Vol. 3. Paris : Pilet Ainé. [607] [this is the designated type species of *Syphonotethis*, a senior synonym of *Molgula* suppressed in favour of the latter name; Pizon, A. (1898). Etude anatomique et systématique des molgulidées appartenant aux collections du Muséum de Paris. *Ann. Sci. Nat. (8)***7**: 305–381 redescribed the type specimen of *Ascidia tumulus* which may be the senior synonym of *Molgula ficus* (Macdonald, 1859)].
Type data: syntypes (probable) MNHP*.
Type locality: Western Port, VIC and Jervis Bay, NSW.

Ascidia succida Stimpson, W. (1855). Tunicata in descriptions of some new marine invertebrates. *Proc. Acad. Nat. Sci. Phila.* **7**: 387–388 [388] [unrecognisable from the original description].
Type data: holotype whereabouts unknown.
Type locality: Port Jackson, NSW.

Ascidia cylindracea Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Part 2. Ascidiidae. *Proc. R. Soc. Edinb.* **10**: 714–726 [714] [Kott, P. (1985). The Australian Ascidiacea Pt 1, Phlebobranchia and Stolidobranchia. *Mem. Queensl. Mus.* **23**: 1–440 (30) thought that this may be synonymous with *A. capillata* Sluiter, 1887, but the type locality is outside the usual range of *A. capillata*].
Type data: holotype whereabouts unknown.
Type locality: off Twofold Bay, NSW.