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SCALLOP FISHERIES: A HITHERTO UNEXPLOITED SEAFOOD RESOURCE IN PAKISTAN

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ABSTRACT

Thirteen species of scallops (Family Pectinidae) were previously reported from Pakistan. The present paper also reports Tranquebar scallop (*Volachlamys tranquebaria*) for the first time from Pakistan. Scallops are considered to be high-priced seafood commodities that have hitherto not been harvested and exported from Pakistan. Although several species are known from Pakistan, however, *Mimachlamys townsendi* (G. B. Sowerby III, 1895) is the only species that grow to commercial sizes and has reasonable stocks that can support a small fishing operation for harvesting and export of scallops from Pakistan. Fishing grounds were identified along the Pakistan coast and harvesting was undertaken by skin diving. Large-sized scallops were cut opened using sharp knives and half-shell meat was frozen and exported for trial shipment to Southeast Asian and Persian Gulf countries fetching reasonably high prices. This led to the establishment of small-scale scallop fisheries in Pakistan. Since its start in February 2023, 12 consignments have been exported from Pakistan opening a new avenue for fisheries of Pakistan.

Key-words: Scallops, Family Pectinidae, *Volachlamys tranquebaria*, Karachi scallop, *Mimachlamys townsendi*, manual harvesting, adductor muscle, export.

INTRODUCTION

Scallops are considered to be an important seafood item which is known for its high prices. These are marine bivalves that have a widespread distribution in the global ocean. The scallops have brightly coloured, symmetric, and fan-shaped shells and often fluted ornamentation are valued by shell collectors, and have been used since ancient times as motifs in art, architecture, and design. Scallops inhabit all the oceans of the world, with the largest number of species living in the Indo-Pacific region. Most species live in relatively shallow waters from the low tide line to 100 m, while others prefer much deeper water. Scallops are considered to be important and high-priced seafood items which is relished in many countries. Unfortunately, scallops are not harvested or consumed in Pakistan, therefore, its fisheries could not be established in Pakistan.

There are 13 species of scallops were reported from Pakistan (Kazmi *et al*., 2018, 2022). Sowerby (1895) has described *Pecten townsendi* (now known as *Mimachlamys townsendi*). Melvill (1898) and Melvill and Standen (1906) have added to the list of species occurring in Pakistan. In addition, Hussain (2003), Ranjha (1960), Khan and Dastagir (1972), and Moazzam and Ahmed (1995) have added to the information about scallops in Pakistan. Winckworth (1948) reported the occurrence of large sizes of *Mimachlamys townsendi* in Karachi and studied the growth and reproduction of this species. The present paper reviews the scallops species occurring in Pakistan, adds a record of another species *Volachlamys tranquebaria* and also describes details of the scallop fishery which was recently established in Pakistan

MATERIAL AND METHODS

Published scientific literature was examined for the records of species of scallops occurring along the Pakistan coast. Information about the fisheries of *Mimachlamys townsendi* including fishing ground, handling, processing, and export was obtained from the only exporter of scallops from Pakistan. To determine the size distribution, length, and breadth of *Mimachlamys townsendi*, shells were measured at the same processing and export facilities.

RESULTS AND DISCUSSION

Scallops belong to Family Pectinidae which was not separately studied in Pakistan, however, genera and species of this family are included in many checklists and other studies. Kazmi *et al*. (2018) have updated the list of species

of family Pectinidae and reported 13 species. The present paper adds another species *Volachlamys tranquebaria* (Gmelin, 1791) to the scallop fauna of Pakistan.

Species of Family Pectinidae Occurring in Pakistan.

Genus *Mimachlamys* Iredale, 1939
Mimachlamys sanguinea (Linnaeus, 1758) (Fig. 1): Reported from Pakistan by Kazmi *et al.* (2018), from Karachi by Melvill and Standen (1906) as *Pecten layardi* and *P.senatorius*.

Fig. 1. *Mimachlamys sanguinea* collected from Cape Monz in October 2003. (a) Exterior view. (b) Anterior view

Mimachlamys crassicostata (G. B. Sowerby II, 1842): Reported from Pakistan by Kazmi *et al.* (2018).

Mimachlamys townsendi (G. B. Sowerby III, 1895) (Fig. 2) may be referred to as Karachi scallop

Description (adapted after Sowerby III, 1895). The shell is broadly fan-shaped, rounded, and thick. The left valve is convex, smooth, concentrically very lightly laminated, reddish-yellow, painted with irregular wavy bands of reddish-brown and fleshy-white, with 20 ribs, rounded, not striate, and broad, flattened, striate, subequal ears. The right valve is less convex, the ribs are slightly lighter.

Fig. 2. Karachi scallop (*Mimachlamys townsendi*). (a) Exterior view. (b) Anterior view.

Shells of Karachi scallop (*Mimachlamys townsendi*), come close to *M. crassicostata* but the former is rounder, the left valve more convex, the auricle more nearly equal, and the ribs much less numerous, not angular or squamose, but smoothly sloping. Neither ribs nor intrerstices have any longitudinal striae.

Reported from Pakistan by Hussain (2003), Ranjha (1960) and Kazmi *et al.* (2018). Its holotype was collected from Karachi (Sowerby, 1895). Subsequently this species was reported from Karachi by Melvill and Standen (1906), Winckworth (1948); Khan and Dastagir (1972) and Moazzam and Ahmed (1995). Along Karachi coast it was reported from Baba Island, G. M. Hut (Pasha Bundar-PNS Nathia Galli) and Manora (Khan and Dastagir, 1972;). Moazzam and Ahmed (1995) reported this species from Cape Monz, Ormara Pedi Zur, Taq, Ras Juddi, Astola Island, Jiwani whereas Khan and Dastagir (1972) also reported this species from Pasni, Ormara and Mekran Coast whereas it was reported from Gwader by Melvill (1898). This species is widely reported from the Arabian Sea including Pakistan, the West coast of India, Oman, Iran, Yemen, Socotra Island, Somalia, and Tanzania (GBIF, 2024).

Genus *Argopecten* Monterosato, 1889
Argopecten gibbus (Linnaeus, 1758): Reported from Pakistan by Kazmi *et al.* (2018). It is primarily a species known from the Atlantic Ocean. Its presence in Pakistan is doubtful.

Genus *Pascahinnites* Dijkstra and Raines, 1999
Pascahinnites coruscans (Hinds, 1845): Reported from Pakistan by Kazmi *et al.* (2018). Shah *et al.* (2003) reported this species from Karachi as *Chlamys coruscans.*

Genus *Decatopecten* Sowerby, 1839
Decatopecten amiculum (Philippi, R. A. 1851): Reported from Pakistan by Kazmi *et al.* (2018). Melvill and Standen (1906) reported this species from Karachi as *Pecten flabelloides*.

Decatopecten plica (Linnaeus, 1758): Reported from Pakistan by Kazmi *et al.* (2018). Melvill and Standen (1906) reported this species from Karachi as *Pecten plica*

Decatopecten radula (Linnaeus, 1758): Reported from Pakistan by Kazmi *et al.* (2018). Shah *et al*. (2003) reported this species from Karachi *as Comptopallium radula.*

Genus *Scaeochlamys* Iredale, 1939
Scaeochlamys lemniscata (Reeve, 1853): Reported from Pakistan by Kazmi *et al.* (2018) considering it to a synonym of *Pecten luculentus* which was reported from Karachi by Melvill and Standen (1906). According to WoRM (2024) *Pecten luculentus* is a synonym of *Semipallium fulvicostatum.* The presence of *S. lemniscata* in Pakistan is not confirmed although it a widely distributed species in the Indo-Pacific area (GBIF, 2024).

Genus *Haumea* Dall, Bartsch and Rehder, 1938
Haumea minuta (Linnaeus, 1758): Reported from Pakistan by Kazmi *et al.* (2018). Shah *et al*. 2003 *as Chlamys inaequivalvis,*

Genus *Gloripallium* Iredale, 1939
Gloripallium pallium (Linnaeus, 1758): Reported from Pakistan by Kazmi *et al.* (2018). Shah *et al.* (2003) reported this species from Karachi.

Gloripallium spiniferum (G. B. Sowerby I, 1835): Reported from Pakistan by Kazmi *et al.* (2018). Shah *et al.* (2003) reported this species from Karachi. This species is known from Eastern Central Pacific including French Polynesia, Cook Islands and Pitcairn Islands (GBIF, 2024). Its presence in Pakistan is doubtful.

Genus *Semipallium* Jousseaume, 1928
Semipallium fulvicostatum (A. Adams & Reeve, 1850): Melvill and Standen (1906) reported this species from Karachi as *Pecten luculentus.*

Genus Volachlamys Iredale, 1939
Volachlamys tranquebaria (Gmelin, 1791) (Fig.3)

Description (Adapted after Suresh *et al*., 2013): The shell is highly variable in colour pattern, but usually white, well-defined broad shell, carrying reddish brown or chestnut transverse bands, typically in the form of broadly expanded V-shaped marking pointing towards the umbo, but frequently these bands lose their distinctness and become more irregular in shape tending to cohere with each other. The radial ribs on the surface are strongly developed. The upper surfaces of these ribs are smooth, but their sides are finely serrated. The ribs are round and sharp at the ventral side with a small interspace between them. Sculpture of 19 to 23 rounded ribs with similarly sized grooves is present on both surfaces of this bivalve species.

Fig. 3. Tranquebar scallop (*Volachlamys tranquebaria*). (a) Exterior view. (b) Anterior view

The species is ranged between 30 and 50 mm in height. Its shell is similar to *Volachlamys singaporina* (Sowerby II, 1842) which has more square ribs and known from western side of Pacific Ocean. It is also close to *Volachlamys fultoni* (Sowerby III, 1904) from South Africa, however, *V. tranquebaria* is usually bigger, more colourful and ribs are sharper with a smaller interspace between the ribs

This species was originally reported from Tharangambadi (previously known as Tranquebar), Nagapattinam District, Tamil Nadu along Coromandel Coast. It is also known from , the Chennai, Gulf of Mannar and Digha coast of the Bay of Bengal (Venkatraman *et al*., 2002; Ramakrishna *et al*., 2003) and Vellar estuary, south-east coast of India (Suresh *et al*., 2013). It is also known from Thailand, East Africa, Yemen, Central and East India, Indo-China, Indo-Malaysia and Australia and now from the northern Indian Ocean along the coast of Pakistan. During the present study, a left valve of this shell was collected from Daran, Jiwani in March, 2019.

SCALLOP FISHERIES OF PAKISTAN

Scallops were not commercially harvested in Pakistan except for small quantities of Karachi scallop (*Mimachlamys townsendi*) which used to be picked up from intertidal rocky shores or as bycatch of bottom set gillnet operation or trawling done along the nearshore waters (off rocky shores) along the coast of Pakistan. These shells were used in the ornamental shell trade based in Clifton and Saddar Karachi. Because of its extraordinarily large size, shells of Karachi scallop (*Mimachlamys townsendi*) fetches higher prices than other shells in the local market as well as in export.

Being aware of the presence of Karachi scallop (*Mimachlamys townsendi*) in the infra- and sub-littoral areas along Pakistan, Moazzam and Ahmed (1995) pointed out that there seems to be limited possibility of establishing a fishery because of the small size of the stocks. They, however, pointed out that this species is widely distributed along Pakistan coast including Manora, Buleji, Cape Monz, Ormara (Padi Zur), Taq, Ra Juddi, Astola Island and Jiwani. Interestingly, *Mimachlamys townsendi* grows to a large size of 238.0 mm (Winckworth, 1948; Pectensite, 2024). According to Winckworth (1948) this species is plentiful on rocks exposed to very low water at Karachi. Based on the analysis of the growth, he concluded that this species spawns throughout the summer months and

attains a length of 25 to 56 mm by January with an annual average increase of about 24 mm. He also concluded that the largest specimen (196 mm) was 7.5 years old whereas the one with a size of 177 and 176 mm were 6.5 years old.

Establishment of scallop fisheries for export

After continual persuasion, interest was generated in one of the seafood exporters who engaged a group of fishermen living in villages along the rocky shores of Karachi to dive for harvesting Karachi scallop (*Mimachlamys townsendi*). In October 2023, a breakthrough was achieved and areas with a large of number scallops were identified along subtidal rocky areas along the Karachi coast. Commercial harvesting of scallops was started in November 2023 using skin diving and snorkelling in the infra-littoral zone along rocky shores. About 200 to 300 kg of scallops were harvested daily and their cleaning and processing were initiated.

Fig. 4. Fishing fleet engaged for harvesting of scallops along Karachi coast

Fishing Fleet

Double-edged wooden boats categorized as 'horas' which are powered by longtail engines are used for the harvesting of the scallops from the coastal areas of Karachi (Fig. 4). The fishermen do not wear any protective and safety gear and dive to a maximum depth of about 10 m (Fig. 5). Some of those who have snorkel use them during these dives and manually pick scallops from the crevices in the rocky platforms and boulders. Locating scallops during short dives of 2 to 4 minutes requires skill as scallops are encrusted heavily with epibionts and are camouflaged with the environment of the area. Harvested scallops are placed in wicker baskets and delivered to the processing factory.

Fig. 5. One of the fishermen who were engaged in harvesting of scallops along with a fishing boat ('hora').

Processing

Noticeable epibionts are removed from the surface of the scallop and washed to remove grit and sand. The scallops are graded according to major sizes and shells are shucked carefully using a knife which is inserted into the hinge of the shell, and twisted to pop it open. The knife is further slid down the flat side of the top shell to separate the scallop meat from the top shell. Once separated, the top shell is pulled off completely.

Since Karachi scallop is a large and heavy-shelled species, therefore, it is seldom exported in "whole shell" form. In most cases, the importers demand to remove one shell, and a shell with adductor muscles and complete viscera attached to one valve may be supplied to them (Fig. 7a). In such cases, only the shell is opened and washed to remove dirt or sand and frozen. In other cases, some exporters demand to remove stomachs before freezing. In such cases, an angled incision is made with a sharp knife to cut away the black stomach sack from the white scallop meat.

Fig. 6. Scallops harvested from rocky shores along Karachi Coast

Fig. 7. Shucked scallops (a) showing adductor muscle and viscera (b) showing adductor muscle, viscera and roe.

A few importers, mainly in USA, demand that in addition to the stomach, the top and bottom mantles are also removed. This can be done manually and mantles are discarded and only adductor muscle and coral roe, are left attached to the shell. In addition, some exporters only require adductor muscle or adductor muscle/roe (Fig. 7b). In Europe, the roe is saved and served along with the adductor muscle, covered by a rich sauce, and topped with browned bread crumbs (called Coquilles St. Jacques). In such cases, the knife is used to scrape along the underside of the scallop to separate the meat from the bottom shell. It is done carefully so that roe may not be damaged.

Scallop meat with or without roe is rinsed in water to remove grit, wastes, or any other extraneous material. These are then frozen in blast tunnel at -38°C and stored at -18°C till export. Since its start in February 2023, 12 consignments have been exported from Pakistan opening a new avenue for fisheries of Pakistan. Since there is a market for the scallop shells, therefore, all shells after removal of meat are cleaned, dried (Fig. 8 a, b), and sold locally to vendors of ornamental shells.

Fig. 8. Scallops after removal of meat. (a) Exterior view. (b) Anterior view

Size Distribution

Karachi scallop (*Mimachlamys townsendi*) is known to grow to a large size. According to Pectensite (2024) it may attain a size of 238.0 mm. Winckworth (1948) reported a maximum size of 196 mm. During the present study, the length and breadth of 530 specimens were recorded which revealed that the size range of commercially harvested specimens ranged between 110 and 170 mm (Fig. 9a). The size class 140 mm was reported to be most dominating followed by 160 mm and 130 mm. The scallops of size 110 mm were observed to be the least representative in the harvested shells. There was a positive coefficient of correlation (r^2 = 0.9871) between length and breadth (Fig. 9b). It may be pointed out that Karachi scallop is among the largest scallops, therefore, most of these will be in the largest marketable category of less than 8 pieces per pound (<U8).

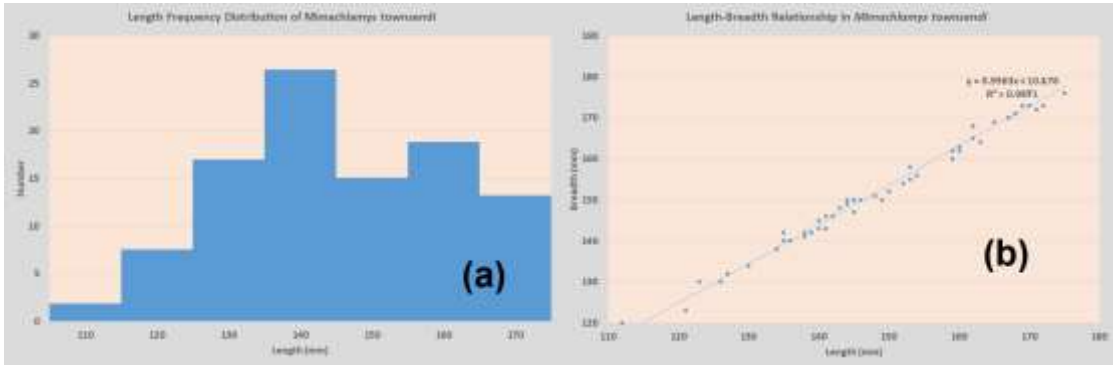

Fig. 9. (a) Length frequency distribution and (b) length-width relationship in Karachi scallop (*Mimachlamys townsendi*).

Breeding of Karachi scallop (*Mimachlamys townsendi*)

According to Winckworth (1948) this species is plentiful on rocks exposed to very low water at Karachi. Based on the analysis of the growth, he concluded that this species spawns throughout the summer months. Present investigation was started in November 2023 and continued upto January 2024. During this period, almost about 15

% of the scallop shells were observed to have ripe roes (Fig. 7b) indicating that this species may be breeding throughout the year with a peak season in winter (November to January). To ascertain the breeding pattern including spawning season, there is a need to undertake a study on its reproductive biology for a complete year.

DISCUSSION

Of 14 species of scallops reported from Pakistan only one species *Mimachlamys townsendi* is found in commercial quantities. *Volachlamys tranquebaria* is reported for the first time from the Pakistan coast but it is still known from only one valve collected from Daran, Jiwani in March, 2019. Export of Karachi scallop (*Mimachlamys townsendi*) is started from Pakistan based on specimens collected from diving along Karachi coast. Although presently about 200 to 250 kg shells of scallops are harvested on a daily basis, however, these shells cannot be harvested during May and October because of the prevailing monsoon and resultant turbidity in the area. Its harvesting, therefore, will be restricted to only about six months.

Presently no estimate of the stocks of Karachi scallop (*Mimachlamys townsendi*) is available, however, exploratory diving is being done and new fishing grounds are being added. Since harvesting is being done manually, therefore, mass scale harvesting is not being done, however, still it is feared that this species which achieves large sizes in many years (Winckworth, 1948), may have limited stocks and new recruitment may be slow, therefore, there is a need to have a careful look at the stock position. Harvesting levels, therefore, have to be controlled. Presently scallops is being exported to Southeast Asia and Persian Gulf countries, however, buyers and Europe, USA and Canada have shown interest in buying scallop meat. Therefore, the future increase in the harvesting to meet these demand can further add to the pressure on the scallops stocks which requires its regular monitoring.

Scallop cultivation was developed in Japan in the late 1960s where it rapidly restored production of the Yesso scallop (*Patinopecten yessoensis*). Success in Japan encouraged other countries to develop their own scallop farmed industries. Global farmed scallop production amounted to 2.12 million tonnes in 2018, with a value of USD 5.8 billion. China produced more than 90% of this volume. Other important producing countries are Japan, Peru, Chile, South Korea and Russia. Scallops are farmed in several different ways. Hanging culture uses rafts or floating longlines, under which pearl lanterns, mesh pockets or trays are suspended in the water. Ranjan *et al.* (2017) have included Tranquebar scallop (*Volachlamys tranquebaria*) in the list of prioritized species that can be farmed. Considering fear of limited stocks possibility of farming of *Volachlamys tranquebaria* and *Mimachlamys townsendi* may be examined which may help in expanding of the nascent export of scallops from Pakistan.

REFERENCES

Adams, A. and L. A. Reeve (1850). *Mollusca*. In: A. Adams (ed.), *The zoology of the voyage of H.M.S. Samarang, under the command of Captain Sir Edward Belcher, C.B., F.R.A.S., F.G.S., during the years 1843-1846*. Reeve & Benham, London. Pp. 45–87.

Dall, W. H., P. Bartsch, and H. A. Rehder (1938). A manual of the Recent and fossil marine pelecypod mollusks of the Hawaiian Islands. *Bulletin of the Bernice P. Bishop Museum,*153: 1-233.

Dijkstra, H. H. and B. K. Raines (1999). *Pascahinnites* n. gen. *Pecten* (*Chalmys*) *pasca* Dall, 1908, a cemented Easter Island scallop (Bivalvia, Pectinidae). *Basteria,* 63: 199-203.

GBIF (2024). *The Global Biodiversity Information Facility*. (https://www.gbif.org/occurrence/search?offset=120&taxon_key=4373519).

Gmelin, J. F. (1791). Vermes. In: (Gmelin J. F. ed.) *Caroli a Linnaei Systema Naturae per Regna Tria Naturae*, Ed. 13. Tome 1(6). G.E. Beer, Lipsiae. Pp. 3021-3910.

Hinds, R. B. (1845). Mollusca. In: *The zoology of the voyage of H. M. S. "Sulphur", under the command of Captain Sir Edward Belcher, R. N., C. B., F. R. G. S., etc., during the years 1836-42*. Smith, Elder and Co., London, Pp. 49-72.

Hussain, S. M. (2003). *Brief Report on Biodiversity in the Coastal Areas of Pakistan*. Regional Technical Assistance. (RETA) ADB/IUCN.113p (Draft).

Iredale, T. (1939). Mollusca. Part I. *Scientific Reports of the Great Barrier Reef Expedition, 1928-1929.* 5: 209-425.

Jousseaume (1928). Les Peignes de la Mer Rouge as (Lamy, E.) (d'après les matériaux recueillis par le Dr. Jousseaume). *Bulletin du Muséum National d'Histoire Naturelle,* 34: 166-172.

Kazmi, Q. B., M. M. Khan, R. Naushaba and M. A. Kazmi (2022). *Marine Faunal Diversity of Pakistan: Inventory and Taxonomic Resources* (Edited by A. R. Shakoori). Zoological Society of Pakistan, Lahore.

Kazmi, Q. B., M. Moazzam and R. Sultana (2018). *Marine Molluscan Fauna of the Pakistani Coastal Waters*. Marine Reference Collection and Resource Centre, University of Karachi, Karachi – Pakistan. 467p.

Linnaeus, C. (1758). *Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Editio decima, reformata [10th revised edition], vol. 1: 824 pp. Laurentius Salvius: Holmiae*

Melvill, J. C. (1898). Further investigations into the molluscan fauna of the Arabian Sea, Persian Gulf and Gulf of Oman with descriptions of forty species (mostly dredged by F. W. Townsend Esq.). *Memoirs and Proceedings of Manchester Literary and Philosophical Society*, 42: 1-40.

Melvill, J. C., and R. Standen (1906). The Mollusca of the Persian Gulf, Gulf of Oman and Arabian Sea, evidenced mainly through the collections of Mr. F. W. Townsend, 1893-1906; with descriptions of new species. Part. II. Pelecypoda. *Proceedings of Zoological Society of London*, 783-848.

Moazzam, M., and J. Ahmed (1995). Prospects of development of molluscan fisheries in Pakistan. In: *Proceedings of National Seminar of Fisheries Policy and Planning* (A. Majid, Y. Khan, M. Moazzam and J. Ahmed eds.) pp. 41-76. Marine Fisheries Department, Karachi

Monterosato, T. A. di. (1889). Coquilles marines marocaines. *Journal de Conchyliologie.* 37: 20-40 and 112-121.

Pectensite (2024). Collection Arne Ghys (https://www.pectensite.com/testframeset.html).

Philippi, R. A. (1851). Centuria quinta testaceorum novorum. *Zeitschrift für Malakozoologie*, 8: 81-96.

Ranjan, R., M. Muktha, S. Ghosh, A. Gopalakrishnan, G. Gopakumar and I. Joseph (eds.). (2017). *Prioritized Species for Mariculture in India*. ICAR-CMFRI, Kochi. India.

Ranjha, A. R. (1960). Edible molluscs of Pakistan. *Proceeding of 4th Pan Indian Ocean Congress Series* B: 167-171.

Reeve, L. A. (1853). *Monograph of the genus Pecten. In: Conchologia Iconica, or, illustrations of the shells of molluscous animals and unpaginated text.* L. Reeve & Co., London. 13-16, 17-20, 21-28, 29-32, 33-35.

Shah, B., M. A. Karim and R. Meerani, (2003). *Commercially important Sea Shells of Pakistan. Specially found at Sindh Coast*. Directorate of Fisheries (Research and Development) Government of Sindh. Pp 10.

Sowerby, G. B. I. (1835). Characters of and observations on new genera and species of Mollusca and Conchifera collected by Mr. Cuming. *Proceedings of the Zoological Society of London*, 3: 109-110.

Sowerby, G. B. II. (1839). *A Conchological Manual*. G. B. Sowerby, London,

Sowerby, G. B. II. (1842). Monograph of the genus *Pecten*. In G. B. Sowerby II (ed.), *Thesaurus conchyliorum, or monographs of genera of shells*, Vol. 1 (2): 45–78.

Sowerby, G. B. III. (1895). Descriptions of nine new species of shells. *Proceedings of the Malacological Society of London*, 1: 214-217**.**

Suresh, M., A. Arularasan and M. Nithyanandan (2013). Occurrence of Tranquebar scallop *Volachlamys tranquebaria* in Vellar estuary, south-east coast of India. *Marine Biodiversity Records*, 6: e38 (1-3).

Winckworth, R. (1948). A large *Pecten* from Karachi. *Journal of Molluscan Studies*, 27: 185.

WoRM (2024). https://www.marinespecies.org/aphia.php?p=taxdetails&id=207867

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