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REVIEW ARTICLE

Private Seashells Collection in Istanbul

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Abstract
Besides National and University collections, private collections are very important for scientists. This paper deals with the seashells collection of the "CAN GEYRAN Seashells Center". The "CAN GEYRAN Seashells Center" houses more than 10,000 seashells, complete with data, collected by self-collection, for trade, exchange or donations over approximately 50 years. The Center has a 450 m² exhibition area where approximately 320 seashells are exhibited along with some handcrafts, objects indicating the relationship between humans and shells. The center has also a library with more than 1800 publications mainly about the seashells of Turkish seas.

Keywords: Seashell, Seashells Center, Natural History Collection, İstanbul

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Introduction

Seashells have drawn the attention of human beings since the earliest times. The variability of their shapes and the esthetics of their colors have led to them being used for different purposes besides consumption as food. They are used as money, personal adornment, pots & pans, tools like oil lamps, storage containers, blades and scrapers, as a status symbol, as musical instruments, for communication, and as a calcium carbonate source in earlier industries to dye the fabrics to purple color signifying the royalty etc. (Stix *et al.* 1973).

In ancient times, collecting seashells was only for specific uses. It was not until the 4th century BC that the Greek philosopher and natural historian Aristotle began to collect seashells for scientific purposes and has mentioned some mollusks and their shells in his work "*The History of Animals*". With the discoveries of new lands, a growing interest in natural objects in the 15th and 16th centuries led to the rich seashell collections of wealthy Europeans (Thomas, I., 2007). Most of these collections are, now, in different natural history museums. The science dealing with seashells is "Malacology". However, starting from the second half of the 17th century, the term "Conchology" began to be used for the science which exams shells. By then, it has been recognised that the shell cannot be examined without considering the animal. So "Malacology" became the only science which examines all the mollusks with or without shells (Fig. 1)

There are numerous seashells collectors, in Turkey some of whom are recognized throughout the world. In fact, the Hydrobiology Museum (IUSHM) in the Science Faculty at Istanbul University houses a collection by the keen collector İsmet Tümtürk who passed away in 1988. This collection is world famous for its "Pectinidae*"* species.

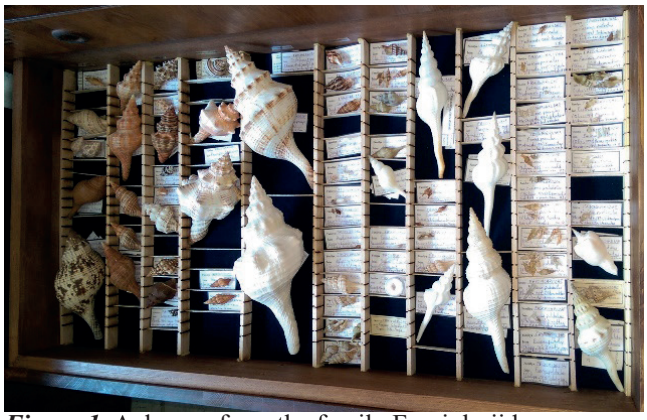

Figure 1. A drawer from the family Fasciolariidae

In Turkey, the first book mentioning seashells is "Boğaz ve Adalar Sahillerinin Omurgasız Dip Hayvanları" (The mollusks of the deep waters of the Bosphorous and the Prince Islands) written by Prof. Muzaffer Demir (Demir, 1952). A recent study published by Öztürk *et al*. (2014) states that, in Turkish seas, there are 1057 species of mollusks bearing a seashell. However, this number increases every year because of new discoveries and Lessepsian species.

The aim of this paper is to highlight the existence of a seashell collection and give some preliminary information about its contents for scientists or enthusiasts who are carrying out study in this field.

Material and Methods

A seashell is a mollusk which lives in seas or brackish waters and bears an inner or outer shell. In the nomenclature of seashells, Linnaeus's binominal system is used like the other living creatures. The data regarding the shells includes the seashell's name, author's name, locality, sampling date and information about the habitat. The data (species and author names) is checked periodically for update using WORMS (World Register of Marine Species).

Figure 2. The outside view of the Center

There are six main classes of seashells: *Bivalvia, Cephalopoda, Gastropoda, Monoplacophora, Polyplacophora, Scaphopoda.* The collection contains seashells from all the classes except *Monoplacophora*. This class contains about 25 species which live in deep water and are rarely seen in personal collections. All seashell materials can be found in the "CAN GEYRAN Seashells Center" (Fig.2, Fig.3).

Figure 3. An inner view from the Center

Results

In the Center the specimens are arranged from the most numerous classes to the less numerous ones. In a class, they are arranged in subclasses, superfamilies and families. The results are given in this paper mainly on superfamilies, if they exist, otherwise on families.

Figure 4. *Aptyxis syracusana* (Linnaeus, 1758)
A Gastropoda sample from the "FASCIOLARIIDAE" family

Class Gastropoda

This single shelled class is the largest one known generally as sea snails. The name comes from their movement. They move by sliding with a ventral muscle. This class includes about 70,000 living species. (Fig. 4)

A Gastropoda sample from the "FASCIOLARIIDAE" family

They may be carnivorous or herbivorous. Some of the carnivorous species are poisonous and attacks on humans may require medical intervention (Fig. 5)
Figure 5. Conus aulicus Linnaeus, 1758
A Gastropoda sample from the "CONIDAE" family

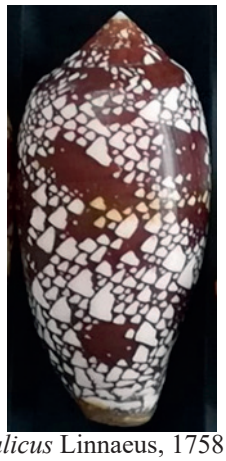

Figure 5. *Conus aulicus* Linnaeus, 1758
A Gastropoda sample from the "CONIDAE" family

Subclass Caenogastropoda
Superfamily Calyptraeoidea Lamarck, 1809
Capuloidea J. Fleming, 1822
Cingulopsoidea Fretter & Patil, 1958
Cypraeoidea Rafinesque, 1815
Ficoidea Meek, 1864
Littorinoidea Children, 1834
Naticoidea Guilding, 1834
Pterotracheoidea Rafinesque, 1814
Rissooidea Gray, 1847
Stromboidea Rafinesque, 1815
Tonnoidea Suter, 1913
Truncatelloidea Gray, 1840
Vermetoidea Rafinesque, 1815
Xenophoroidea Troschel, 1852 (1840)
Buccinoidea Rafinesque, 1815
Conoidea J. Fleming, 1822
Mitroidea Swainson, 1831
Muricoidea Rafinesque, 1815
Olivoidea Latreille, 1825
Turbinelloidea Rafinesque, 1815
Volutoidea Rafinesque, 1815

Subclass Heterobranchia
Superfamily Architectonicoidea Gray, 1850
Cimoidea Warén, 1993
Mathildoidea Dall, 1889
Murchisonelloidea T. L. Casey, 1904
Omalogyroidea G.O. Sars, 1878
Acteonoidea d'Orbigny, 1842
Rissoelloidea Gray, 1850
Ringiculoidea Philippi, 1853
Akeroidea Mazzarelli, 1891
Aplysioidea Lamarck, 1809
Bulloidea Gray, 1827
Cylichnoidea H. Adams & A. Adams, 1854
Haminoeoidea Pilsbry, 1895
Philinoidea Gray, 1850 (1815)
Cavolinioidea Gray, 1850 (1815)
Siphonarioidea Gray, 1827
Umbraculoidea Dall, 1889 (1827)

Subclass Neritimorpha
Superfamily Neritoidea Rafinesque, 1815

Subclass Patellogastropoda
Superfamily Lottioidea Gray, 1840
Patelloidea Rafinesque, 1815

Subclass Vetigastropoda
Superfamily Fissurelloidea J. Fleming, 1822
Haliotoidea Rafinesque, 1815
Lepetelloidea Dall, 1882
Lepetodriloidea McLean, 1988
Scissurelloidea Gray, 1847
Pleurotomarioidea Swainson, 1840
Seguenzioidea Verrill, 1884
Trochoidea Rafinesque, 1815

Class Bivalvia
The second largest class, which was formerly called "*Pelecypoda"* or "*Lamellibranchia"* consists of the seashells having two valves mostly symmetrical and connected by a hinge (Fig. 6).

Figure 6. *Laternula anatina* (Linnaeus, 1758)
A Bivalvia sample from the LATERNULIDAE family

Most of them are sedentary filter feeders. They have mostly been consumed as a food since early times (Fig. 7). They are also the main sources of the pearls and the mother-of-pearls.

Figure 7. *Pecten maximus* (Linnaeus, 1758)
A Bivalvia sample from the PECTINIDAE family

Subclass Heterodonta
Superfamily Carditoidea Férussac, 1822
Crassatelloidea Férussac, 1822
Cuspidarioidea Dall, 1886
Pandoroidea Rafinesque, 1815
Poromyoidea Dall, 1886
Thracioidea Stoliczka, 1870
Hiatelloidea J.E. Gray, 1824
Solenoidea Lamarck, 1809
Cardioidea Lamarck, 1809
Tellinoidea Blainville, 1814
Galeommatoidea J.E. Gray, 1840
Gastrochaenoidea Gray, 1840
Lucinoidea J. Fleming, 1828
Thyasiroidea Dall, 1900
Dreissenoidea Gray, 1840
Myoidea Lamarck, 1809
Pholadoidea Lamarck, 1809
Arcticoidea Newton, 1891
Chamoidea Lamarck, 1809
Glossoidea J.E. Gray, 1847
Mactroidea Lamarck, 1809
Ungulinoidea Gray, 1854
Veneroidea Rafinesque, 1815

Subclass Protobranchia
Superfamily Nuculanoidea H. Adams & A. Adams, 1858
Nuculoidea Gray, 1824

Subclass Pteriomorphia
Superfamily Arcoidea Lamarck, 1809
Limoidea Rafinesque, 1815
Mytiloidea Rafinesque, 1815
Ostreoidea Rafinesque, 1815
Pinnoidea Leach, 1819
Pterioidea Gray, 1847 (1820)
Anomioidea Rafinesque, 1815
Pectinoidea Rafinesque, 1815

Class Scaphopoda
The seashells, in this class, are named as “Tusk Shells” because of the resemblance of the shell to an elephant’s tusk. It is a tapered, tubular, slightly curved shell, open at both ends (Fig.8).

Figure 8. *Antalis dentalis* (Linnaeus, 1758)
A Scaphopoda sample from the DENTALIIDAE family

They are marine dwellers. They have been used widely for decorative purposes.

Family Dentaliidae Children, 1834
Fustiariidae Steiner, 1991
Gadilidae Stoliczka, 1868
Entalinidae Chistikov, 1979

Class Polyplacophora
Otherwise named “Chitons”, these are rock-dwelling marine mollusks. They have oval shaped bodies that are flattened from back to front. Eight overlapping and separate plates form the shell (Fig. 9).

Figure 9. *Chiton olivaceus* Spengler, 1797
A Polyplacophora sample from the “CHITONIDAE” family

They live mostly in shallow water, under rocks and other shells. They feed on small algae and other tiny organisms.

Subclass Neoloricata
Superfamily Cryptoplacoidea H. Adams & A. Adams, 1858
Superfamily Mopalioidea Dall, 1889
Superfamily Chitonoidea Rafinesque, 1815
Family Hanleyidae Bergenhayn, 1955
Family Leptochitonidae Dall, 1889

Class Cephalopoda
This class includes the Chambered Nautilus, cuttlefish and squid species. Most of them have inner backbones (Fig.10).

Figure 10. *Sepia officinalis* Linnaeus, 1758
A Cephalopoda backbone sample from the "SEPIIDAE" family

They are carnivorous. Most cephalopods are small, and they form a major component of the food sources of larger fish and whales. Both abyssal & shallow water forms are found.
The collection has samples of species belonging to the following Families:

Subclass Coleoidea
Family Loliginidae Lesueur, 1821
Family Ommastrephidae Steenstrup, 1857
Family Sepiidae Keferstein, 1866
Family Spirulidae Owen, 1836

Subclass Nautiloidea
Family Nautilidae Blainville, 1825

Discussion

To turn a hobby into a serious collection, one should spend some time, effort and money. There is a market for collectible seashells all over the world. There are also some auctions which are interested in shells. In these markets, sometimes the price of a seashell may reach $ 20.000 depending on its rarity.

I always, prefer to get ten seashells worth $10 each instead of having one $100 seashell. However, the most precious seashell of this collection is a newly described seashell by the friends of the author of this study and named after the author's beloved son Can Geyran: *Turbonilla cangeyrani* Ovalis & Mifsud, 2017 (Ovalis, 2017) (Fig.11).

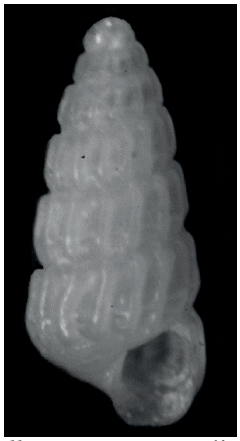

Figure 11. *Turbonilla cangeyrani* Ovalis & Mifsud, 2017

In general, exchange is the most frequently used method along with self-collection to enlarge the collections.
Seashell collections, like other Natural History collection are subject to some restrictions. When collecting seashells, one should not forget that they are living creatures. Therefore, we have to obey some ethical rules during collection.

Rules regarding this can be seen on the collection site http://www.cangshells.com/epublication1-ethical.html.

It is generally accepted that to protect animals we have to know them. Therefore, this center with its collection is helping to raise awareness of marine life. Moreover, these kinds of personal Natural History collections have been the basis of major Natural History Museums for around three hundred years. Thus, this collection may contribute to a Natural History Museum in Istanbul.

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