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Journal homepage: asn.shu.bg**Editorial Note: Black Sea - a pearl in the crown of Bulgaria. Part II. Present****Dimcho Zahariev***Department of Plant Protection, Botany and Zoology, Faculty of Natural Sciences, Konstantin Preslavsky University of Shumen, 9700 Shumen, Bulgaria*

The Black Sea has not only a glorious history, but also a rich and diverse present. In this publication we will look at various aspects of the current state of this sea, which is unique for Europe and the whole planet. One of the reasons for its characteristics is due to its weak connection with the World Ocean.

One of the unique characteristics of the Black Sea is the high content of the poisonous gas hydrogen sulfide. Its distribution begins at a depth of 120-150 m and reaches the bottom. The concentration of hydrogen sulfide below 200 m is in the range of 11-14 ml/l, which makes them unsuitable for life for aerobic living organisms. The formation of hydrogen sulfide is a process that is in equilibrium with its conversion into other chemical compounds: on the one hand it is produced in deep waters and sediments, and on the other hand it is depleted due to its chemical and biological oxidation. The formation of hydrogen sulfide is explained by various theories. The most popular theory is that the main source of hydrogen sulfide in the Black Sea are the processes of anaerobic decomposition of accumulated organic matter by sulfate-reducing bacteria. These organic substances are the result of the mass extinction of planktonic biomass as a result of the entry of salt water into the freshwater lake, which is believed to have been the Black Sea in the past. The second theory cites as a source the faults and mud volcanoes located at the bottom of the sea, including the destructible gas hydrate deposits, which also contain a solid phase of hydrogen sulfide.

A second important feature is the presence of layers of water that are almost immiscible. The difference in the salinity of the water on the surface and in the lower layers is the main feature of the Black Sea. This feature makes it a unique sea not only in Europe but also on the planet. The surface is relatively sweet due to the lower density of river water, which falls into the sea from about 300 rivers flowing into it.

I

The largest of them are: Danube, Dnieper, and Don. At the same time, the inflow of salt water through the Bosphorus is limited by its shallow depth, which in some places reaches 36-40 m. There is a sharp jump in density - the so-called halocline, which prevents the vertical mixing of water masses. The movements of the sea waters are mainly in the horizontal direction. The main sea current in the western part of the Black Sea is counterclockwise. Along the Bulgarian coast the sea current is in the direction from north to south. At a depth of between 100 and 200 m, the waters of the Black Sea hardly mix. At a depth of about 1000 m there is almost no even horizontal circulation.

The third important feature is the presence of an undersea river at the bottom of the Black Sea. It flows through a canal with a depth of about 35 m, a width of about 1 km and a length of about 60 km. The current speed reaches 1.8 m/s (6.5 km/h) and the average flow is 22,000 m³/s. It has been established that if this river were on land, it would be the sixth largest river in the world in terms of water volume. A stream of sand, silt and more salty water flows through the underwater river than the Black Sea water. This mixture still enters through the Bosphorus Strait from the Sea of Marmara and this causes its movement. The underwater river has similar characteristics to rivers on land: banks, floodplains, rapids and even waterfalls. Unlike rivers on land, the vortices of the underwater river, which are formed when water moves around obstacles, swirl clockwise instead of counterclockwise, as is usual for rivers on land in the Northern Hemisphere. Some researchers believe that the underwater river in the Black Sea was formed about 6,000 years ago, when due to rising sea levels, the waters of the Sea of Marmara crossed the Bosphorus and began to enter the Black Sea. However, due to the significant inflow of fresh water from the rivers, the water balance of the Black Sea is positive. Every year about 300 km³ of water passes through the Bosphorus Strait into the Sea of Marmara. A similar underwater river has been discovered against the mouth of the Amazon River in the Atlantic Ocean.

A curious detail about the Black Sea is that there are almost no tides in it. Their height is negligibly small - from 3 to 8 cm. The reason for this lies in its small size and location inland, far from the Atlantic Ocean.

These characteristic physico-chemical features of the Black Sea make it unique in terms of living beings in it. The vast majority of them are concentrated in only 10% of its waters. This is the surface layer to a depth of about 150-200 m. Only anaerobic bacteria are found in the remaining 90% of its waters.

The flora of the Black Sea includes about 1000 species, of which about 300 species of macrophytes and 700 species of microphytes. A characteristic feature of the Black Sea is an area that is covered with floating algae of the genus *Phyllophora*. It is named after its discoverer - Zernov's field. To some extent, it resembles the famous Sargasso Sea, which is part of the Atlantic Ocean. The area of Zernov's field in 1950 was 11,000 km², while now the area is about 500 km².

II

The fauna of the Black Sea includes about 2000 species. It is an interesting combination of freshwater, marine and oceanic species. For example, about 18% of Black Sea fish are typically freshwater and breed in adjacent rivers, but they also tolerate the salinity of seawater by feeding in coastal shallow waters. This unusual group also includes species that live in typical marine conditions, but migrate to rivers to reproduce.

Part of the fauna has a relict character, and another includes alien species that have entered from the Marmara Sea, the Mediterranean Sea and the Atlantic Ocean. About 80% of the relict species are of marine origin and are considered to be the descendants of the fauna of the ancient ocean Tethys. Invasive alien species are a particularly important group. One of the most famous among them is *Rapana thomasiana*. This is a sea snail that entered the Black Sea in the 1950s with ships coming from the Sea of Japan. It causes serious damage to the population of the economically valuable species *Mytilus galloprovincialis*, which it feeds on. Another invasive species that causes serious economic damage in the Black Sea is the ktenophore *Mnemiopsis leidyi*. This species was transported to the Black Sea by ships from the shores of North America in the 1980s. Externally, it resembles a small jellyfish and causes a reduction in anchovy stocks because it feeds not only on zooplankton, but also fish caviar.

The Black Sea coast on the territory of the Republic of Bulgaria is very diverse. The north and south coasts are literally like the two sides of the same coin - they are similar in shape but differ in detail. To the north, steep limestone and loess rocks predominate, alternating with vast sandy beaches covered with golden fine sand. It is believed that they formed at the bottom of the ancient Sarmatian Sea, which covered these lands, which are now part of the land. To the south, the rocks testify to active volcanic activity. The border between north and south is delineated by the ends of a long mountain range, which is called Stara Planina, but is better known by the name Balkan, hence the name of the peninsula on which Bulgaria is located - the Balkan Peninsula.

The Bulgarian Black Sea coast is a suitable place for summer vacation. It has a length of 378 km and it has 209 beaches with a total area of 16 km². Most of the beaches are large in area, while others are small and located in picturesque sea bays. Almost all beaches are covered with fine sand. The beaches and the sea offer conditions for practicing various types of water sports (surfing, water skiing, diving) and fishing (including underwater).

Bulgarian Black Sea resorts offer a wide variety of tourist services: hiking, cycling and horseback riding, eco-tourism, photo safaris, visiting natural, cultural and archaeological sites. In the northern part of the Bulgarian Black Sea coast there are 3 golf courses, offering world-class conditions for practicing this sport. Opportunities for yacht tourism on the North Black Sea coast offer: Rusalka resort, Tyulenovo, Balchik, Golden Sands resort complex and Varna, and on the Southern Black Sea coast: Bourgas, St. Vlas, Nessebar, Sozopol, and Duni.

III

Along the Bulgarian Black Sea coast are located a large number of coastal lakes (lagoons and estuaries): Aleppo, Arkutino, Atanasovsko Lake, Balchishka Tuzla, Beloslavsko Lake, Burgasko Lake, Varnensko Lake, Durankulashko Lake, Ezeretsko Lake, Nanevska Tuzla, Orlovo Marsh, Pomoriysko Lake, Stomoplo (Marsh), and Shablensko Lake. There are many rare plants and animals in them. On the shores of some of the lakes there are deposits of healing (estuarine) mud, which is used for mud treatment. Such lakes are: Pomoriysko Lake, Varnensko Lake, Balchishka Tuzla, Shabla, Rusalka, and Atanasovsko Lake.

Some of the rivers in Bulgaria, which flow into the Black Sea, are navigable for small motor boats and offer tourists unforgettable walks along the current. These are: Kamchia, Ropotamo and Veleka. The rich variety of natural habitats, many of which are included in the European ecological network "Natura 2000" and the unique forests along the banks, near the mouths of the rivers Batova, Kamchia, Ropotamo and Veleka are suitable for nature lovers. There are also mineral springs along the coast and the combination of all the described natural resources is the reason for the successful combination of SPA, balneo and wellness tourism with a sea holiday.

Interesting sites for tourists are the five islands off the Bulgarian Black Sea coast: St. Anastasia, St. Ivan (where the relics of St. John the Baptist were found), St. Peter, St. Kirik and Yulita, St. Thomas.

The resorts on the Bulgarian Black Sea coast can be divided into several groups: The most preferred by families with children are: Albena, Rusalka, St. St. Constantine and Helena, Riviera, Obzor, Elenite, and Duni. Young people and teenagers prefer the resorts: Sunny Beach, Golden Sands, Primorsko, Kiten, Lozenets because of the large number of clubs, bars and entertainment opportunities. The largest resort in Bulgaria is Sunny Beach and often hosts parties of world-famous DJs and musicians. Romantically minded tourists are attracted to Sozopol and Nessebar. These two cities with a thousand-year history are known for their combination of beautiful coastal nature and historical landmarks. Nessebar is included in the List of UNESCO World Heritage Sites.

Some of the hotels in the Black Sea resorts are open all year round and offer the opportunity for congress tourism, holding various events and incentive events. Visitors to the Bulgarian Black Sea coast have the opportunity to enjoy numerous cultural events. Such are, for example: Varna Rock Fest, Varna Summer International Music Festival, Apollonia Arts Festival, Spirit of Burgas, Burgas International Folklore Festival, Burgas International Film Festival, Solar Summer Festival, and others.

All this makes the Bulgarian Black Sea coast a real pearl in the crown of Bulgaria.

Front Cover

The Black Sea coast, south of the village of Sinemorets, Bulgaria

Photo by Prof. Dimcho Zahariev

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