ACTUAL PROBLEMS OF MODERN SCIENCE, EDUCATION AND TRAINING

KHOREZMSCIENCE.UZ

CONTENTS

UDC: 606, 574, 582.261

BUKHARA REGION MOKHI-KHOSSA WATER BASIN SANITARY-HYGIENIC INSPECTION

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Annotatsiya. Ma'lumki, insoning yashash tarzi, hayot mamoti suv bilan bog'liq. Shuning uchun bo'lsa kerak, yer yuzidagi qadimiy manzillardan tortib, toki hozirgi kundagi zamonaviy qishloqu shaharlargacha, hammasi suv manbai-buloqlar, soylar, daryolar, ko'llarga yaqin yoki bevosita ular bo'yida joylashgan. Qadimdan xonliklarda shahar atrofi va chekkasida joylashgan saroylarda hovuzlar qurilgan. Buxoro shahrida bir qancha saroylar majvud bo'lib, shulardan mashhuri Mohi xossa bog' saroyidir. Saroyda katta hajmda hovuz bo'lib, hozirgi kunga qadar saqlab qolingan. Sitorai Mohi xossa – Buxorodagi Mang'itlar sulolasining III avlodiga mansub saroy-bog'. Buxoro shahridan 4 km uzoqda. Bog'ning janubida ikki qavatli masjid, katta hovuz 1917-1918 yillarda qurilgan. Hovuz kulrang G'ozg'on marmari bilan qoplangan. Mohi xossa xalq tilida "Amir Olimxonning dachasi" deb yuritiladi. Sababi Buxoroning so'ngi amiri Sayid Olimxon asosan eski shahar markazidagi Ark qo'rg'onida istiqomat qilgan. Hordiq chiqarish uchun Mohi xossani afzal bilgan. Mohi xossa forscha - "oyga o'xshash yulduz" degan ma'noni anglatadi.

Kalit so'zlar: *zooplankton, aralashma, gidrokimyoviy holat, nitrit, nitrat, sulfat, azot, ifloslanish, fiziologik eritma, mikroskop.*

Аннотация. Известно, что образ жизни и быт человека связан с водой. Вероятно, поэтому, от древних поселений на земле до современных сел и городов, все они расположены вблизи или непосредственно на берегах водных источников – родников, ручьев, рек, озер. Издревле пруды строили в ханствах на окраинах и во дворцах на окраинах. В городе Бухара имеется несколько дворцов, самым известным из которых является садовый дворец Мохи Хоса. Во дворце есть большой бассейн, который сохранился и по сей день. Ситораи Мохи Хоса — дворец-сад, принадлежащий III поколению династии Мангит в Бухаре. В 4 км от города Бухары. На юге сада в 1917-1918 годах построены двухэтажная мечеть и большой пруд. Бассейн покрыт серым гозгонским мрамором. На языке Мохи Хоса он называется "Дом Амира Алимхана". Причина в том, что Сайид Алимхан, последний эмир Бухары, в основном жил в крепости Арк в центре старого города. Для отдыха он предпочитал Мохи Хоссу. Мохи Хоса в переводе с персидского означает "луноподобная звезда".

Ключевые слова: *зоопланктон, смесь, гидрохимическое состояние, нитрит, нитрат, сульфат, азот, загрязнение, физиологический раствор, микроскоп.*

Abstract. It is known that a person's way of life and life is connected with water. That is probably why, from the ancient settlements on the earth to the modern villages and towns, all are located near or directly on the banks of water sources - springs, streams, rivers, lakes. Since ancient times, ponds were built in khanates in the suburbs and in the palaces on the outskirts. There are several palaces in the city of Bukhara, the most famous of which is the Mokhi Khosa Garden Palace. There is a large pool in the palace, which has been preserved to this day. Sitorai Mokhi Khosa is a palace-garden belonging to the III generation of the Mangit dynasty in Bukhara. 4 km away from Bukhara city. In the south of the garden, a two-story mosque and a large pond were built in 1917-1918. The pool is covered with gray Gozgon marble. In the Mokhi-Khosa vernacular, it is called "Amir Olim Khan's cottage". The reason is that Sayid Olimkhan, the last emir of Bukhara, mainly lived in the Ark fortress in the center of the old city. He preferred Mokhi-Khosa for recreation. Mokhi Khosa means "Moon-like Star" in Persian.

Keywords: *zooplankton, mixture, hydrochemical state, nitrite, nitrate, sulfate, nitrogen, pollution, physiological solution, microscope.*

Introduction

Various research methods are used in hydrology in order to fully study the laws of phenomena occurring in water basins, draw appropriate conclusions and effectively use them in practice. Among them, the most important are stationary, expedition and experimental-laboratory methods. We have also conducted several studies in order to determine the hydrochemical composition of the Mokhi-Khosa reservoir. Today, the safety of the water in the pool is under constant control due to the fact that the Mokhi-Khosa ancient object is under state protection and is a tourist zone. Research works are carried out in different seasons of the year depending on the air temperature. Preservation of the natural microflora and microfauna in the pool is one of today's urgent issues [1-3].

Literature Review

Strategy of actions on the five priority areas of further development of the Republic of Uzbekistan, in paragraph 3.3 [10] "… further strengthening the food security of the country, expanding the production of environmentally friendly products" is the most motivated for the Uzbek scientists.

In Republic of Uzbekistan, recently certain scientific results are being achieved in the field of reproduction of phytozooplankton of water bodies and biotechnology of their use in fisheries. In this regard, ensuring the stability of water bodies at the usual, national and local levels of the cultivation of microscopic algae, the study of phytozooplankton in the preservation of the biodiversity of hydrobionts, the study of the biotechnology of their reproduction and application in fisheries is important in the development of relevant recommendations. is considered important [2].

These research works are collected within the framework of laboratory experiment conclusions, scientific literature, articles published in popular scientific magazines and newspapers. Plankton is composed of the phytoplankton (“the plants of the sea”) and zooplankton (zoh-plankton) which are typically the tiny animals found near the surface in aquatic environments. Like phytoplankton, zooplankton are usually weak swimmers and usually just drift along with the currents. Plankton are comprised of two main groups, permanent members of the plankton, called holoplankton (such as diatoms, radiolarians, dinoflagellates, foraminifera, amphipods, krill, copepods, salps, etc.), and temporary members (such as most larval forms of sea urchins, sea stars, crustaceans, marine worms, some marine snails, most fish, etc.), which are called meroplankton. Along with phytoplankton, zooplankton are key components of marine ecosystems forming the base of most marine food webs [7]. The correct place to begin any exposition of a major component in biospheric functioning is with precise definitions and crisp discrimination. This should be a relatively simple exercise but for the need to satisfy a consensus of understanding and usage. Particularly among the biological sciences, scientific knowledge is evolving rapidly and, as it does so, it often modifies and outgrows the constraints of the previously acceptable terminology. I recognized this problem for plankton science in an earlier monograph (Reynolds, 1984). Since then, the difficulty has worsened and it impinges on many sections of the present book. The best means of dealing with it is to accept the issue as a symptom of the good health and dynamism of the science and to avoid constraining future philosophical development by a redundant terminological framework [8].

Research Methodology

Spring and autumn samples are taken to study the phytozooplankton in the water of Sitorai Mokhi-Khosa pond. The chemical composition of the pond water, the level of oxygen, the distribution of organisms was studied. Water was sampled early in the morning. In the process of determining the pH of the water, the color of the indicator paper turned yellow. It corresponded to the indicator of pH=7. In the process of determining the color of the water using a special scale, it corresponded to the XVI index, and it was determined that the water is normal according to the color.

After that, a sample was taken from the water basin through special phytozooplankton living nets. Our catch net was floated across the pond to a certain — distance for the water to enter. We put the phytoplankton sample that fell into our net into a special container. We put the zooplankton set in the same order. We also went to take samples from the South-Eastern part of the pond. The water is polluted with grass and leaves. The sample was collected in special containers. All samples obtained were examined in a biological laboratory. Phytoplankton and zooplankton organisms in the pond were observed under a microscope.

Daphnia feed on small, suspended particles in the water. They are suspension feeders (filter feeders). The food is gathered with the help of a filtering apparatus, consisting of the phyllo pods, which are flattened leaf-like legs that produce a water current. As the current flows anterior to posterior, the Daphnia collect particles that are transferred into the food groove by special setae. Although the feeding apparatus is so efficient that even bacteria can be collected, the food is usually made up of planktonic algae.

Green algae are among the best food, and most laboratory experiments are done with either Scenedesmus or Chlamydomonas, both of which are easy to culture in monoclonal chemostats.

Figure 1. Digital image of Mokhi Khosa property complex.

Daphnia usually consume particles from around 1 μm up to 50 μm, although particles of up to 70 μm in diameter may be found in the gut content of large individuals. The gut is more or less tubular with three parts: the esophagus, the midgut, and the hindgut. There are two small digestive ceca (diverticula) that are easily seen in the head section of the midgut. The midgut is lined with an epithelium and bears microvilli. Peristaltic contractions of the gut wall pass food through the gut, but a peritrophic membrane contains the food and prevents it from entering the ceca. Epithelial cells do not phagocytose particles but absorb molecules. The pH is 6 to 6.8 in the anterior part of the midgut and 6.6 to 7.2 in the posterior part. Food is expelled from the hindgut by peristaltic movement but also requires the pressure of more recently acquired food particles. The color of *Daphnia* adapts to the food that is predominant in their diet. *Daphnia* feeding on green algae will be transparent with a tint of green or yellow, whereas those feeding on bacteria will be white or salmon-pink. Well-fed animals are more strongly colored than starved animals [9].

The dynamics of food uptake follow a functional response type 1. Below a certain food concentration (the incipient limiting level), the food uptake from the water (feeding rate) is proportional to the food concentration, and the filtering rate (amount of water filtered per unit time) is maximal. Above this level, the feeding rate is constant because the filtering rate decreases with increasing food concentration in the water. For parasites that enter the host with the food particles, infection rates depend on the food concentration in the water. Highest infection rates are expected when filtering rates are maximal.

We took the samples we took for testing to the “Microbiological Analysis” and “Communal Hygiene” laboratories and relevant departments of the Bukhara City Sanitary-Epidemiological Peace and Public Health Center.

Figure 2. Digital images from the laboratory process.

Analysis and Results

In experiment 1, the hardness of water was determined. For this we take 50 ml of tested water. We put 6-7 drops of chrome dark violet indicator on it. Mix well and add 5 ml of acetate buffer solution. Then we titrate with 0.05 normal Trilon-1. Until a blue color is formed. How many ml of Trilon-1 was used when the color is dark blue, and this is a hardness indicator. According to the test results, the water hardness level is high. The hardness was 28.2 mg/l. We calculated as follows:

$$28.2 \times 1.0 \times 0.05 \times 1000 \div 50 = 28.2 \text{ mg/l}$$

Normal hardness is in the range of 7-10.

Determination of residual chlorine in water in experiment 2. For this purpose, we take 40 ml of distilled water and 10 ml of tested water, then add 15 drops of chromium oxide potassium K_2CrO_4 indicator and titrate with $AgNO_3$ (yellow) solution 0.5N. We do this until a reddish color is formed.

$$Cl = 14.6 \times 10 \times 0.5 \times 1000 \div 10 = 730 \text{ mg/dm}^3$$

14.6 ml of $AgNO_3$ were used and the formula determined the amount of Cl_2 chloride at 730 mg/dm^3. The norm should be 350 mg/dm^3.

Determination of Ammonia in water in experiment 3. Determination of the N_2 group in water. We add 1 ml/l of zincian and 1 ml/l of Nessler's reagent (K_2 HgJ_4 × NaOH) on 10 ml of tested water. If the water contains NH, the water will turn yellow. Otherwise, the color of the water will remain unchanged. A small amount of NH_3 was detected in the tested water.

Determination of nitrite group in water in experiment 4. We put reactive Grissa on 10 ml of tested water. We mix it in a small amount and put it in a water bath with 60-70 ℃. The sample turned pink. It was concluded that it contains a nitrite group.

Figure 3. The process of taking water samples from a pond in the Mokhi-Khosa area.

According to the conclusions of the inspection, today the level of water pollution has increased significantly. But in this water environment, various zooplankton, phytoplankton and fish species grow and develop naturally. The field of science that studies these is called hydrobiology. The parts of hydrobiology that study the natural (physical) properties, chemical and biological processes occurring in water bodies, as well as the natural properties, quality, and biological reserves of water masses in them are called hydrochemistry, hydrobiology [2].

Since ancient times, the water demand of Bukhara region has been met at the expense of the Zarafshan river. However, due to the increased demand for water in the upper part of the Zarafshan river, the water in the part that reaches the territory of the region has decreased over the years, and now the water of the river has been completely stopped in the territory of Navoi region. Today, the part of the Zarafshan river passing through the Bukhara region is called the Central Bukhara Zovuri, where sewage and ditch waters are discharged. Every year, 1.5 million m3 of sewage and ditch water are discharged from the oasis. In the biological treatment of wastewater, together with the scientists of the Bukhara State University and the employees of the water and poultry enterprise, 90-95% of waste water was achieved [6].

The salinity level of water reserves in the existing collectors of Bukhara region varies. The main reason for this is the hot weather, the composition of the water for irrigation and the high salinity of the soil. The main source of water coming to the Mokhi-Khosa reservoir is the collector waters (see in Figure 2).

Conclusions

From the conducted experiments and observations, it was found that the water content of the Mokhi-Khossa reservoir contains nitrite, nitrate, sulfide, sulfate, etc., which are important salts for the reproduction of various zooplankton and phytoplankton. Our mission is to breed zoos and phytoplankton’s in order to improve water microflora and create a natural food supply for fish there.

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