The Effect of Cyanobacteria on Humans

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Abstract

The aim of the current study is: What are the benefits of cyanobacteria on human health, what are the types of cyanobacteria, what is the impact of cyanobacteria on the environment, and what are the dangers of cyanobacteria to humans. The questionnaire was created electronically via Google Drive, and then distributed via mobile phone on the social networking program (WhatsApp). Use email for all participants to respond to the questionnaire. 600 questionnaires were distributed, and 590 questionnaires were received via e-mail. (the target group is residents of the holy city of Mecca and Jeddah, and their ages are between 25-55 years) men and women. It concluded that cyanobacteria are beneficial to humans, and plants.

Keywords: the effect, of cyanobacteria, on humans.

1. Introduction

Cyanobacteria, blue-green bacteria (1)(2) are a phylum of gram-negative bacteria competent of photosynthesis, usually living in water. About two-thirds of the species studied are able of fixing nitrogen, and thus participate in the nitrogen period. Cyanobacteria contain three pigments: green, blue, and red. the green dye is chlorophyll and it helps in the operation of photosynthesis. The blue color is what gives it its blue color, and the reason for this is due to the large presence of blue pigment within it. As for the red color, it is beta-carotene, and we deduce its presence from the flamingo. when the flamingo drinks water, cyanobacteria enter its body, and the pink color show on some parts of its body. Cyanobacteria are currently seeing a series of bacteria, so they are also called cyanobacteria. It has become clear that they are not closely linked to plants. They are not concerning to plants in any way (contrary to what was expected), nor to fungi and animals. Cyanobacteria or cyanobacteria are a various group of gram-positive bacteria. the harm of cyanobacteria produces and the symbiosis of algae and bacteria (3), and the nutrient impact of cyanobacteria flower (4). Cyanobacteria flowering will cause hypoxia in the water, as they

amassed and rot, creating in various toxic secondary metabolites and other harmful compounds (such as toxins, hydrogen sulfide, and odor substances) (5), which have an impact on the watery flora and fauna, and the society building and quantity of microorganisms (6). Cyanobacteria blooms not only harm aquatic creatures but also endanger human health. Direct or indirect connect with cyanobacterial toxins drive acute gastroenteritis, respiratory adverse reaction, skin rash, oral ulcer, and other illness (7), and even induce cancer (8). It is considered that cyanobacteria blooms form when the cyanobacteria reaches 105cells/mL, or the chlorophyll a (Chla) concentration reaches 10 μg/L, and a visible covering layer forms on the surface of the water (9). The cyanobacteria blooms' decay process has a more serious impact on the aquatic environment. Aerobic and anaerobic reactions exist in the degradation process of cyanobacteria, and toxins and odorous gases are freed. During the decomposition of cyanobacteria blooms, a large number of organic substances and dissoluble nutrients will be released to water, which will lower the translucence of water, aggravate the eutrophication of water, and form "black spots" (10). Cyanobacteria blooms will lead to the acidity of the water, the high trend of conductivity, the continuous raise in chemical oxygen request, and the rise in organic matter concentration in the water (11). In addition, organic debris created by cyanobacteria accumulation has a high decomposition rate in the water, which can be decomposed by 41.9% within 48 h (12), which will harm the ecosystem of the water (9,13). A large amount of dissolved organic matter (DOM) is released during the decline of cyanobacteria, and with the progress of the reaction, dissolved organic carbon (DOC) is converted into dissolved inorganic carbon (DIC), and most of them are, lastly, turn into humus, which is challenging to degree. Impacts of Cyanobacteria Blooms on Human Health Cyanobacteria blooms directly impact drinking water. In 1996, in Caruaru, Brazil, 50 dialysis clinic patients died because of using water polluted with MCs (14). In 1999, the cyanobacteria blooms in Dianchi Lake covered an area of 20 km2. In May 2007, a massive cyanobacteria bloom in Taihu Lake (Wuxi, China) led to a drinking water crisis for 2 million people in the city of Wuxi (15).).

2. Material and Methods:

The study started in (the holy city of Mecca and Jeddah in Saudi Arabia), began writing the research and then recording the questionnaire in June 2024, and the study ended with data collection in September 2024. The researcher used the descriptive analytical approach that uses a quantitative or qualitative description of the social phenomenon (the effect of cyanobacteria on humans), the independent variable (the percentage of influence of cyanobacteria on humans) and the dependent variable (the percentage of influence of cyanobacteria in water on) . This kind of study is characterized by analysis, reason, objectivity, and reality, as it is concerned with individuals and societies, as it studies the variables and their effects on the health of the individual, society, and consumer, the spread of diseases and their relationship to demographic variables such as age, gender, nationality, and marital status. Status, occupation (16), And use the Excel 2010 Office suite histogram to arrange the results using: Frequency tables Percentages (17). A questionnaire is a remarkable and helpful tool for collecting a huge amount of data,

answered the questionnaire electronically, because the questionnaire consisted of eight questions, all of which were closed.

3. Results and discussion:

The participation rate in the research questionnaire among the residents of the city of Mecca was 100%, and was as follows: There was no participation from the age of 25-34 years at a rate of 30.1%, from 35-44 years at a rate of 35.7%, from the age of 45-55 years at a rate of 34.2%,. As for their gender, their percentage of males was 82.4% , while 17.6% of females. Their nationalities were all 100% Saudi, and as for their professions, they were as follows: 95% were government employees, while 3.5% were retired, accounting for 5.1%. As for their educational status, it was as follows: High school diploma and laboratory diploma 5.9%, master's degree 11.8%, health diploma 5.9%, general diploma 11.8%, university 29.4%, higher education 5.9%, bachelor's degree in science 5.9%, ordinary bachelor's degree 17.6%. Regarding the research questions, the participants' responses were as follows: The first question: Do Asco bacteria help photosynthesis in plants? Yes 82.4% and no 17.6%. The second question: Cyanobacteria contain three pigments: green, blue, and red? Yes 88.2% and no 11.8%. The third question: Are cyanobacteria found in environmental sites such as soil, vegetables, sewage water, skin, and skin stains? Yes 70.6% and no 29.4%. The fourth question: One of the dangers of cyanobacteria is that it turns into a deadly weapon as a result of climate change: 76.5% and 23.5%. The fifth question: What are the benefits of cyanobacteria? It helps plants grow and obtain clean, oxygen-filled air? 70.6% and 29.4%. The sixth question: What types of cyanobacteria are: Spirulina (food supplement), Spirulina ordonesii, Spirulina agillus, stromatolite? Yes 76.5% and no 23.5%. the seventh question: Do cyanobacteria reproduce asexually through cell division? Yes 93.8% and no 6.2%. The eighth question about the importance of cyanobacteria is that it produces intracellular and extracellular substances: antifungal, antiviral, anticancer, antioxidant, and antibiotic for bacteria (Gram positive)? Yes 82.4% and no 17.6%. (Table no.1) (Figure No.1)

Table.No.1: Percentage of male and female participants in the questionnaire

Percentage of males	Percentage of females
82.4%	17.6%

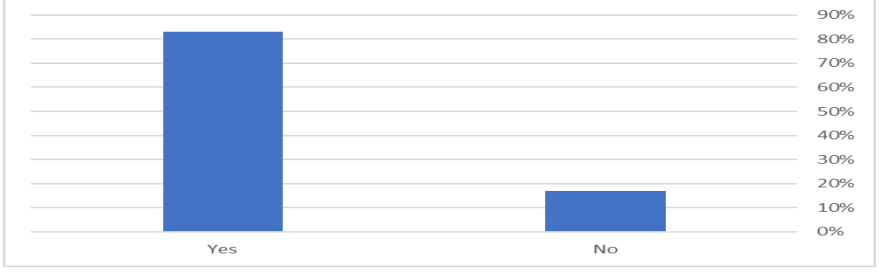

Figure No.1: The effect of cyanobacteria on human health according to the opinions of participants

4. Conclusion:

According to the opinions of male and female participants, the presence of cyanobacteria in environmental sites such as soil, vegetables, wastewater, skin, and skin spots: 70.6%, and its dangers are that it turns into a deadly weapon as a result of climate change: 76.5%, and its benefits are that it helps plants grow and obtain clean air filled with oxygen: 70.6%, and its importance It produces substances inside and outside the cell: antifungal, antiviral, anticancer, antioxidant, and antibiotic for bacteria (Gram positive) 82.4%. The importance of cyanobacteria for humans, as they provide plants with oxygen that humans benefit from in their lives, and they also help plants grow, and this is considered a positive aspect. It found that cyanobacteria are beneficial to humans, as they provide plants with oxygen, which benefits humans in their lives, and helps plants grow, and this is considered a positive aspect.

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