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Toxic Species (Pseudo-nitzschia Seriata) in the Southern Caspian Sea

Tahami FS* and Keyhan Sani AR

Iranian Fisheries Research Organization, Iran

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***Corresponding author:** Tahami FS, Agricultural Research, Education & Extension Organization, Iranian Fisheries Research Organization - Caspian Sea Ecology Research Center, Iran, Email: farnaz_tahami@yahoo.com

Abstract

This study done in 2010-2011 through Spring, Summer, Autumn and Winter, in 32 studies from 8 transects (Astara, Anzali, Sefidrood, Tonekabon, Noshahr, Babolsar, and Bandar Turkman). In each transect, have choosen 5 stations and different depths of 5m, 10m, 20m, 50m and 100m were sampled quarterly from the zero depth (level), 10m, 20m, 50m and 100m were by Niskin sampler. Since 2005 a new species of diatoms called Pseudo-nitzschia seriata found in the southern Caspian Sea and in the Caspian Sea, adapted itself to new conditions and the ability to grow and reproduce in the environment has increased. Pseudo-nitzschia seriata is a eukaryotic cell with ability to produce Domic acid that can be harmful to aquatic and human.Due to various Physic and Chemical factors such as temperature change (change of seasons), high concentrations of dissolved nitrogen in all of these examples can effect on the toxin (Domic acid) production, then in different seasons, transects and deeps are different. This fish disease because of some factors such as temperature change (change of seasons), high concentrations of dissolved.

Keywords: Phytoplankton; Caspian Sea; Bacillariophyta; Seasonal Diversity

Introduction

Microbial metabolites that are different unusual nature of all of them is not clear and the aquatic ecosystem and work to limit the toxic microorganisms is very important and need to have adequate notice of microorganisms [1]. Determine the production base (density and biomass of phytoplankton) in the seasons and different parts of the ecosystem, helping to make administrative decisions on management of fisheries, including the possible adoption of fry released for restocking, linking environmental, construction of structures marine, prevent pollution of urban, agricultural and marine engines, as well as improving transit fleet and maritime transport be effective.

During recent years, the presences of *Mnemiopsis.leidyi* shoulder catch some fish changed. Following the decline in zooplankton and some fish species in recent years to identify and estimate the amount of plankton including copepoda, protozoa, Cladocera, Rotifera as well as distribution of benthic organisms as well as the abundance of phytoplankton is important.

Since phytoplankton are the base of life and production in aquatic ecosystems, then, ecological study continuing of Caspian Sea, particularly the distribution and identification of species composition, density and biomass, seasonal fluctuations and regional phytoplankton before each study seems necessary. Due to various circumstances Physical and Chemical factors of the river leading to the sea, seabed topography situation seems to be different and the amounts of primary production in the eastern and western regions and between the Caspian Sea in different seasons are different. Also, influenced by the arrival of new planktonic species such as the Black Sea to the Caspian Sea *Mnemiopsis leidyi* [2] and density of aquatic species diversity and abundance of phytoplankton has increased drastically changed. Therefore, by identifying the different species and determine the distribution and biomass of phytoplankton changes and unaffected by changes in biotic and abiotic environment we find knowledge. Also, comparing the current situation with previous studies, we find that the number and types of plankton biomass has been changed. The other parameters of the Caspian Sea are salinity that average salinity is 12.85 grams per liter.

Different areas of the Caspian Sea (North, Central, and South) have a different salinity. The average salinity of 10.5 grams per liter in the Caspian Sea and Volga River is less than 0.5 grams per liter. In the middle area of 12.7 grams per liter at the surface and in the far from of coast is 13-13.2 grams per liter. In the southern region is 13 grams per liter and in the regions of Turkmenistan is

13.2 to 13.4 grams per liter [3] and in the southern Caspian Sea, at different depths have different salinities.

Method

The survey of Southern Caspian Sea started with the collaboration of the Caspian Sea Research Institute in Ecology [4]. For maturing of Pseudo-nitzschia seriata, choose 8 line Astara, Anzaly, Sefidrood, Tonekabon, Nooshahr, Babolsar Amir Abad and Babdar Torkman that every line have 4 stations (A, B, C, D) and water for analysis have taken from different deeps (0,5,10,20,50,100) meter in southern of Caspian sea by Niskin sampler [5] and then transferred to laboratory of Caspian sea ecological institute [6] (Figure 1).

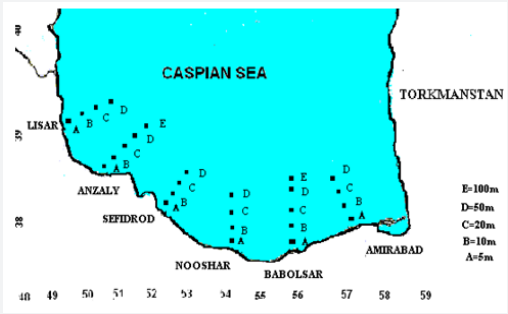

Figure 1: Sampling stations studied in the southern Caspian Sea.

Results and Discussion

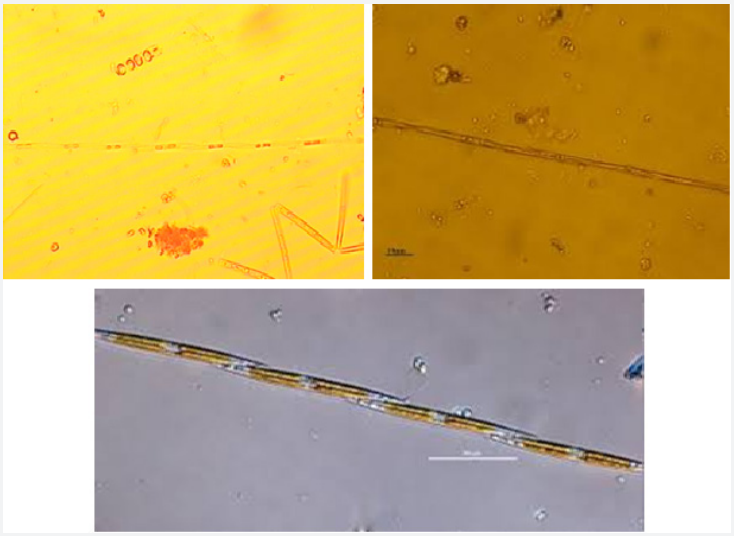

Figure 2: Pseudo-nitzschia seriata.

Pseudo-nitzschia seriata is eukaryotic cell that produces Domic acid, which can be dangerous for aquatic animals and even humans. This identification process is carried out on the basis of the size and contents of the cell. Pseudo-nitzschia seriata cell size is on average 50±1105 square micron and silica walls of their cells are next to each other in series and each series has 20 cells is also visible together. Basically, this pathogen through the production and release toxins Domic acid is effective and usually, this disease appear in aquatic animals by changing of some factors such as temperature (change of seasons), high concentrations of water-soluble nitrogen linked (Figure 2).

Seafood poisoning due to consumption of sea fish affected by the toxins happening. This America is the operating principle of food borne diseases [7].

Common symptoms of the disease include nausea, vomiting, gastritis, muscle pain and in severe cases death. While globalization has made it possible to infect marine organisms sold in markets around the world, all the people who consume seafood, are exposed to this dangerous threat. It enters the food chain. These toxins accumulate in the flesh of fish and the bigger fish tend to eat the same thing that people who are poisoned after eating also.

A total of three important factors affecting the functionality and durability (Domic Acid) include temperature, light, pH and silica. Silica solution is considered to be one of the Nutrients Sea and colloidal solution available. The main source of the river abundance of silica can be cited [8]. The use of this factor is very low compared to its production and thus a significant amount of debris it is measurable. The amount of silica non-consumable biological communities of the forms of inorganic phosphorus and nitrogen more [9]. This allows identifying areas of low and high consumption of silica even in seasons that provide high photosynthetic activity [3].

The silica and phosphate can be limiting factors for growth of the microorganism. Phosphorus is a limiting factor in the cultivation of Pseudo-nitzschia seriata and thus produce Domic

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Acid is in the growth phase, so that the phosphorus reduction, growth stalled in the first stage and then decreases and cultured living (Stationary Growth Phase).

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