Opinion
Volume 13:9, 2022

Journal of Biosensors & Bioelectronics

ISSN: 2155-6210 Open Access

Micronucleus Experiment in Aquaculture Industry

Ane Galarneau*

Research Director, CNRS Institute Charles Gerhardt of Montpellier, France

Introduction

The aquatic environment is the final recipient of a growing number of toxins as a result of the discharge of industrial, agricultural, and municipal wastes. A significant variety of pollutants in this complex combination are responsible for numerous impacts on creatures, including humans, and ecosystem levels, influencing organ function, reproductive status, species survival, population growth, and, ultimately, biodiversity. Carcinogenic and mutagenic substances are the most dangerous, as their effects may extend beyond the person and may be active in subsequent generations.

About the Study

Epizootic neoplasms have been discovered in a range of ectothermic animals, including shellfish, echinoderms, jawless fish, and bony fish. It has been shown that there is a direct relationship between the occurrence of cancer in aquatic animals and the concentration of chemical contaminants. Furthermore, the decrease in the incidence of liver tumours in fish populations living polluted areas after the source of pollution was removed supports the significance of the "natural remediation effect" and the need of early identification of pollutant sources [1].

The availability of detection technologies and the inability to forecast the toxicity of complex combinations restrict environmental monitoring by direct chemical analysis of water and sediment. The assessment of a wide variety of xenobiotically caused alterations in sentinel species' cellular or biochemical components, processes, structures, or activities can reveal early reactions to environmental stress. Routine aquatic biomonitoring programmes currently entail the use of a variety of biomarkers in different bioindicators with diverse techniques in order to evaluate the pollutant-induced stress syndrome [2].

Genotoxic effects as primary indicators in assessing pollution-related toxicity should be included in the battery. Large-scale biomonitoring programmes in maritime settings have revealed links between genotoxicity and chronic health impacts at the population level. Because of its simplicity, the micronucleus test is one of the most relevant procedures for detecting genetic abnormalities in environmental animals. This approach is technically simpler and faster than microscopic investigation of chromosomal abnormalities in metaphase, especially since many aquatic creatures have tiny chromosomes that are difficult to analyse [3].

This technique is designed to detect interphase cells from any growing cell population, independent of karyotype. One of the reasons why this biomarker is so commonly used in environmental biomonitoring programmes is because of this. MN are produced during cell division, and their expression can occur at various periods following the DNA damage event, depending on the cell cycle dynamics and the manner of induction. The MN test, which was originally designed for mammalian species, is now frequently used in fish and other aquatic creatures such as sea urchins, mussels, oysters, crabs, and worms, as well as in wild and transplanted animals.

The vast majority of research or programmes on the genotoxic effect of pollution on the environment have used bivalves and fish. Because of their wide geographic distribution, sessile lifestyle, easy sampling, tolerance to a wide range of salinity, high accumulation of a wide range of chemicals, and resistance to stress, bivalves such as mussels have been considered ideal bioindicators for monitoring aquatic contaminants in coastal waters. Mussels, in particular, may be readily caged in suitable containers, which are typically located a few metres beneath the sea surface [4,5].

Conclusion

The Mussel Watch Programs, which used caged animals, were widely used in coastal monitoring, allowing for the study of places where mussels are not normally present and eliminating the effect of genetic and adaptation phenomena, which hampered comparisons between animals from various stations. Although the mussel watch technique has been shown to be a good strategy for biomonitoring aquatic pollution, the employment of fish as environmental bioindicators is important owing to their significance in the aquatic trophic chain.

References

1. Zhang, Diming and Qingjun Liu. "Biosensors and bioelectronics on smartphone for portable biochemical detection." *Biosens Bioelectron* 85 (2016): 283-284.
2. Su, Kaiqi, Xianxin Qiu, Jiaru Fang, and Quchao Zou, et al. "An improved efficient biochemical detection method to marine toxins with a smartphone-based portable system-Bionic e-Eye." *Sens Actuators B Chem* 238 (2018): 1165-1182
3. Li, Shuang, Daizong Ji, Gang Xu, and Jinglong Liu, et al. "Biosensors and Bioelectronics on Smartphone." *Handbook of Cell Biosens* (2022): 628-655.
4. Lu, Yanli, Zhenghan Shi and Qingjun Liu. "Smartphone-based biosensors for portable food evaluation." *Curr Opin Food Sci* 28 (2019): 84-81.
5. Sylvain, Matthieu, Francis Lehoux, Steeve Morency, and Félix Faucher, et al. "The EcoChip: A wireless multi-sensor platform for comprehensive environmental monitoring." *IEEE Trans Biomed Circuits Syst* 12 (2018): 1289-1300.

How to cite this article: Galarneau, Ane. "Micronucleus Experiment in Aquaculture Industry." J Biosens Bioelectron 13 (2022): 351.

***Address for Correspondence:** Ane Galarneau, Research Director, CNRS Institute Charles Gerhardt of Montpellier, France, E-mail: anegalarneau@gmail.com*

Date of Submission: 14 September, 2022, Manuscript No. jbsbe -22-76388; **Editor Assigned:** 19 September, 2022, PreQC No. P-76388; **Reviewed:** 26 September, 2022, QC No. Q-76388; **Revised:** 29 September, 2022; Manuscript No R-76388; **Published:** 03 October, 2022; DOI: 10.38421/2155-6210.2022.13.351