



# Certificate

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## Golden Research Thoughts

This is to certify that our Editorial, Advisory, and Review Board Accepted Research Paper of Dr. /Shri. /Smt.: Sapna R. Kale Topic:- Effect Of Heavy Metal On Aquatic Algae And Influence Of Vermiwash On Algal Growth College:- Department of Environmental Impact and Risk Assessment Division National Environmental Engineering Research Institute (NEERI) Neharu marg Nagpur (MS),India. The Research paper is Original & Innovative it is Done Double Blind Peer Reviewed. Your Article is Published in The Month of May Year 2014



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- Types of damages on buffalo oocytes after vitrification with different concentration of ethylene glycol and dimethyl sulphoxide. Indian Journal of Animal Sciences 83 (7): 713-716, July 2013. S P Deshmukh, C H Pawshe, M V Ingawale, S G Deshmukh and S R Kale

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### Article Review Report



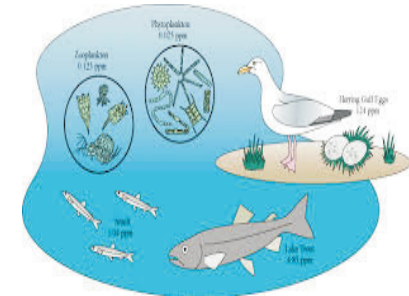
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## ABSTRACT:

Unicellular algae, at the base of most aquatic food chains, are particularly sensitive to a wide range of pollutants and are therefore an important part of a battery of toxicity tests for hazard assessment and aquatic environment protection.

**Abstract Report:** The Title Accurately Said The Study was About.

## INTRODUCTION:

The concentration of heavy metals (Cd, Cu, Zn, Pb, Co, Hg) in the environment is increasing continuously as a consequence of the increased environmental pollution from industrial, agricultural, energetic and municipal sources (Adrino, 1986). However few metals e.g., Cu, Zn, Co, Fe in trace amounts are essential for various metabolic activities of plants. But excess of all kinds of metals (essential and non-essential both) adversely affect the plant metabolism (Hall, 2002).

**Introduction Report:** This Article Include Full Introduction, Methods, Results & Introduction Section.

## METHODS & MATERIALS:

The five day conventional algal bioassay test is carried out to assay the toxicity of heavy metal. The toxicity response of alga towards copper, lead and Chromium to access LC 50 or EC50 concentration. Most algal bioassays are growth inhibition tests, which measure the decrease in growth rate (cell division rate) or final cell biomass.

**Methods & Materials Report:** Tables/Boxes/Diagram & Images are Used to Explain Specific Points or Background Information. Figures That The Plotted Parameters are Clearly Mentioned.

## RESULT:

Like all living organisms, plants are often sensitive both to the deficiency and to the excess availability of some heavy metal ions as essential micronutrient, while the same at higher concentrations and even more ions such as Cd, Hg, as are strongly poisonous to the metabolic activities. Researchers have been conducted throughout the world to determine the effects of toxic heavy metals on plants (Reeves and Baker 2000; Fernandes and Henriques 1991).

**Result Report:** Figures are Imported to Provide Explanation for Background Information. Conclusion of This Paper Clearly Supported Results.

## DISCUSSION

Algal bioassay is the most commonly used. Algae are considered to be reliable indicators of pollution due to their high sensitivity and easy availability, besides simple culturing technique. Due to this characteristic the pollution could be measure as early as possible.

**Discussion Report:** The Text is Rounded off with a Conclusion that Discusses the Implication of The Findings & Ideas Discussed & Their Impact on Future Research Direction.

## REFERENCES:

- Adrino, D C., (1986), Trace Elements in the Terrestrial Environment- Springer-Verlag, New York
- Angelone, M and Bini C et al., (1992), Trace elements concentrations in soils and plants of Western Europe. In: Adriano, D.C. (Ed.), Biogeochemistry of Trace Metals. Boca Raton, FL: Lewis Publishers, pp. 19- 60
- Arunakumara, K K I U., and Xuecheng Z., (2008), Effects of heavy metals (Pb<sup>2+</sup> and Cd<sup>2+</sup>) on the ultrastructure, growth and pigment contents of the unicellular cyanobacterium *Synechocystis* sp. PCC 6803\*. Chinese Journal of Oceanology and Limnology, Vol. 27 No. 2, pp. 383-388
- Baszynski T, Tukendorf A, Ruszkowska M, Skorzynska E, Maksymiec W et al., (1988), Characteristics of the photosynthetic apparatus of copper non tolerant spinach exposed to excess copper. Journal of plant physiology, 132, pp 708-713

**Reference Report:** There are Places where the Author Sapna R. Kale Need to Cite a Reference, but Have Not

## RECOMMENDATIONS:

**Abstract Report:** Introduce New Regular For Content & Communication.

## SUMMARY OF ARTICLE:

	Very	High	Average	Low	Very Low
1. Interest of the topic to the readers	✓				
2. Originally & Novelty of the ideas		✓			
3. Importance of the proposed ideas			✓		
4. Timelines	✓				
5. Sufficient information to support the assertions made & conclusion drawn			✓		
6. Quality of writing(Organization, Clarity, Accuracy Grammer)	✓				
7. References & Citation(Up-to-date, Appropriate Sufficient)			✓		

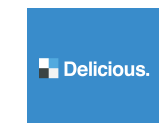
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3. Regarding Professor Promotion (<http://academicprofile.org/Professor/regardingPromotion.aspx>)
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5. Online Course on Research (<http://onlineresearch.in/Default.aspx>)

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