



International Journal of Fisheries and Aquatic Studies

E-ISSN: 2347-5129

P-ISSN: 2394-0506

(ICV-Poland) Impact Value: 5.62

(GIF) Impact Factor: 0.549

IJFAS 2021; 9(6): 38-41

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www.fisheriesjournal.com

Received: 17-09-2021

Accepted: 20-10-2021

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Modelling of almost total depleted arsenic- compounds from hydroponic mediums may possible using methodical, computational, plankton Nanobiotechnology

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DOI: <https://doi.org/10.22271/fish.2021.v9.i6a.2584>

Abstract

The nanobiotechnology is the branch of technology that deals with making structures that are ranged between 0- 500 nanometres of dimension. Molecular diameter of Arsenic and its compounds usually falls within this range and appropriately porous Phytoplankton cells can accumulate this enzymes inhibition bio-molecules. As we all know that Phytoplankton is the base of several aquatic food webs. Phytoplankton, also known as microalgae, are similar to terrestrial plants in that contain chlorophyll and require sunlight in order to live and grow can be provided to Hydroponic mediums as enery supplements. Mere sieving of arsenic compounds by phytoplankton and providing safety hydroponic foods. From both the biological and the toxicological points of view, arsenic compounds can be classified into three major groups: inorganic arsenic compounds; organic arsenic compounds; and arsine gas and all these can be sieved with plankton populations of small and medium in sizes. Nanotechnology and nanobiotechnology with Plankton population are used in recent days for mankind. Arsenic or its compounds can be termed as nano-particles having environmental hazards to all biological cells, tissue, organs. As per molecular dimensions arsenic and arsenic compounds can be sieved by certain plankton populations. Small algae and medium algae can sieve arsenic or its compounds through their appropriate porous cells and accumulate within and can make the aquatic medium free from arsenic and which can be used for hydroponic culture medium and can produce Arsenic free fruit and vegetables.

Keywords: Nanobiotechnology, arsenic removal techniques, plankton population, hydroponic techniques to make arsenic free foods

Introduction

Arsenic compounds persisting in every climates may be more in tropic and subtropical climates. Arsenic contamination is concern and this is not only through food chains but with every environmental produces unlike synthetic agriculture. After thousands of years from now situation can be worsen unless we take precautionary measures to produce Arsenic compound free produces. Although other than foods drinking water can be a source of Arsenic can eliminated using same techniques.

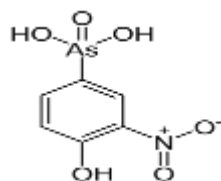


Fig 1: Arsenic compound usually persisting in Hydroponic mediums

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According to Wikipedia the entire followings, the toxicity of arsenic to insects, bacteria, and fungi led to its use as a wood preservative [62]. In the 1930s, a process of treating wood with chromated copper arsenate (also known as CCA or Tanalith) was invented, and for decades, this treatment was the most extensive industrial use of arsenic.

An increased appreciation of the toxicity of arsenic led to a ban of CCA in consumer products in 2004, initiated by the European Union and United States [63, 64]. However, CCA remains in heavy use in other countries (such as on Malaysian rubber plantations). Arsenic was also used in various agricultural insecticides and poisons. For example, lead hydrogen arsenate was a common insecticide on fruit trees [65]. But contact with the compound sometimes resulted in brain damage among those working the sprayers. In the second half of the 20th century, monosodium methyl arsenate (MSMA) and disodium methyl arsenate (DSMA) – less toxic organic forms of arsenic – replaced lead arsenate in agriculture. These organic arsenicals were in turn phased out by 2013 in all agricultural activities except cotton farming. The biogeochemistry of arsenic is complex and includes various adsorption and desorption processes. The toxicity of arsenic is connected to its solubility and is affected by pH. Arsenite is more soluble than arsenate and is more toxic; however, at a lower pH, arsenate becomes more mobile and toxic. It was found that addition of sulfur, phosphorus, and iron oxides to high-arsenite soils greatly reduces arsenic phytotoxicity. Arsenic is used as a feed additive in poultry and swine production, in particular in the U.S. to increase weight gain, improve feed efficiency, and prevent disease [68, 69]. An example is roxarsone, which had been used as a broiler starter by about 70% of U.S. broiler growers. Alpharma, a subsidiary of Pfizer Inc., which produces roxarsone, voluntarily suspended sales of the drug in response to studies showing elevated levels of inorganic arsenic, a carcinogen, in treated chickens. A successor to Alpharma, Zoetis, continues to sell nitarsone, primarily for use in turkeys. Arsenic is intentionally added to the feed of chickens raised for human consumption. Organic arsenic compounds are less toxic than pure arsenic, and promote the growth of chickens. Under some conditions, the arsenic in chicken feed is converted to the toxic inorganic form. A 2006 study of the remains of the Australian racehorse, Phar Lap, determined that the 1932 death of the famous champion was caused by a massive overdose of arsenic. Sydney veterinarian Percy Sykes stated, "In those days, arsenic was quite a common tonic, usually given in the form of a solution (Fowler's Solution). It was so common that I'd reckon 90 per cent of the horses had arsenic in their system. Arsenic in foods may be a huge concern. Arsenic enters in body through food chains and can spoil cellular and extra cellular enzymes. Arsenic problem is not only in ARS, but for geographies with

every living animals! Hydroponics in aquatic environments with smaller and larger algae can accumulate Arsenic or its compounds owing to their appropriate cellular pore-spaces, and make rest of Hydroponic media free from Arsenic or its compounds and make agricultural produces, even non edibles, further harmless within hours.

Methodology

Data science and analytics are used in this modelling methodology. All we know Small and medium planktons fall within the dimension of 500 nano-meters and their porous cell-wall, membrane can help in molecular sieving of Arsenic compounds usually which falls around 1 nm in dimension and can be removed by simply molecular sieving either once or twice. This sieving processes of Arsenic removal with small and medium plankton can be repeated as per our needs and further precisions in different chambers having hydroponics. This Arsenic compounds are usually accumulate in plankton cells and have usual recycle without harming rest of the hydroponic medium further. Data collection and plankton counts are made using mere conventional methods and deterministic and stochastic models are made with modelling software SPSS and EXCEL for deriving models for analytical decision making. As per permissible limits this may be considered that any medium or hydroponics less than 0,1 ppm Arsenic compounds may be a safe, and this Hydroponics mediums to grow safer foods or produces. Author has experimented and successfully grown *Hygrophila auriculata* and anti-anaemic plants having medicinal and extra medicinal Vedic utilities. All we know any plants having fibrous root system can easily be grown in hydroponics mediums. May be good that plankton counts around 2000 is a good Hydroponics that can avoid Arsenic compounds and can produce arsenic-free safety foods. Time span required to make Arsenic compounds depleted hydroponic medium within a few hours at the most a day depending on environmental conditions persist, such as plankton counts factor of sunlight, medium, initial concentrations etc and derived in equations.

Results and Discussions

Deterministic Model

A mathematical representation in which every variable alters according to a mathematical formula, and not to random fluctuations. Supplement. It is one in which every set of variable states is uniquely determined by parameters in the model and by sets of previous states of these variables.

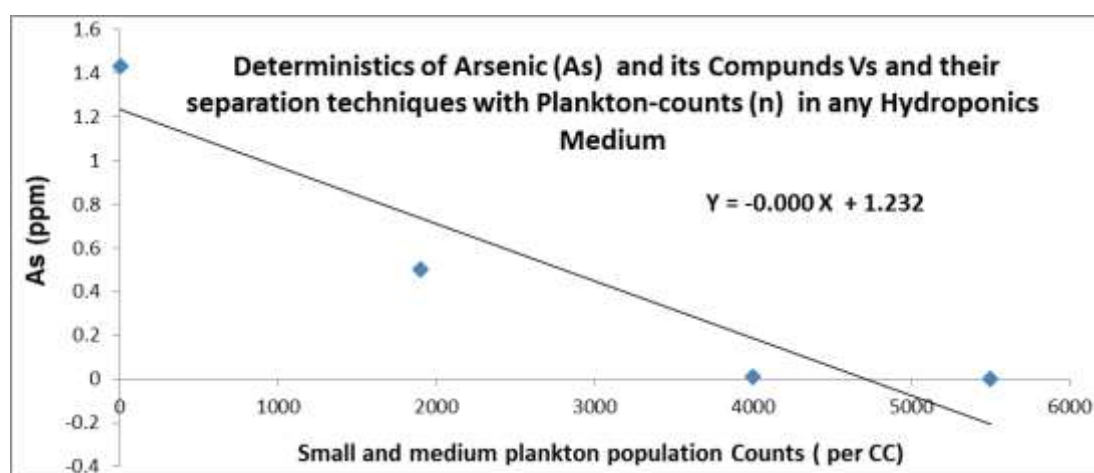


Fig 2: Hydroponics Aquaculture medium containing Arsenic (0.1 ppm may be safer) with Planktonic sieving with Nanobiotechnology in Arsenic removal techniques with Plankton population assisted hydroponic techniques to make arsenic free foods

Stochastic Models

A stochastic model is a tool for estimating probability distributions of potential outcomes by allowing for random variation in one or more inputs over time. The random

variation is usually based on fluctuations observed in historical data for a selected period using standard time-series techniques.

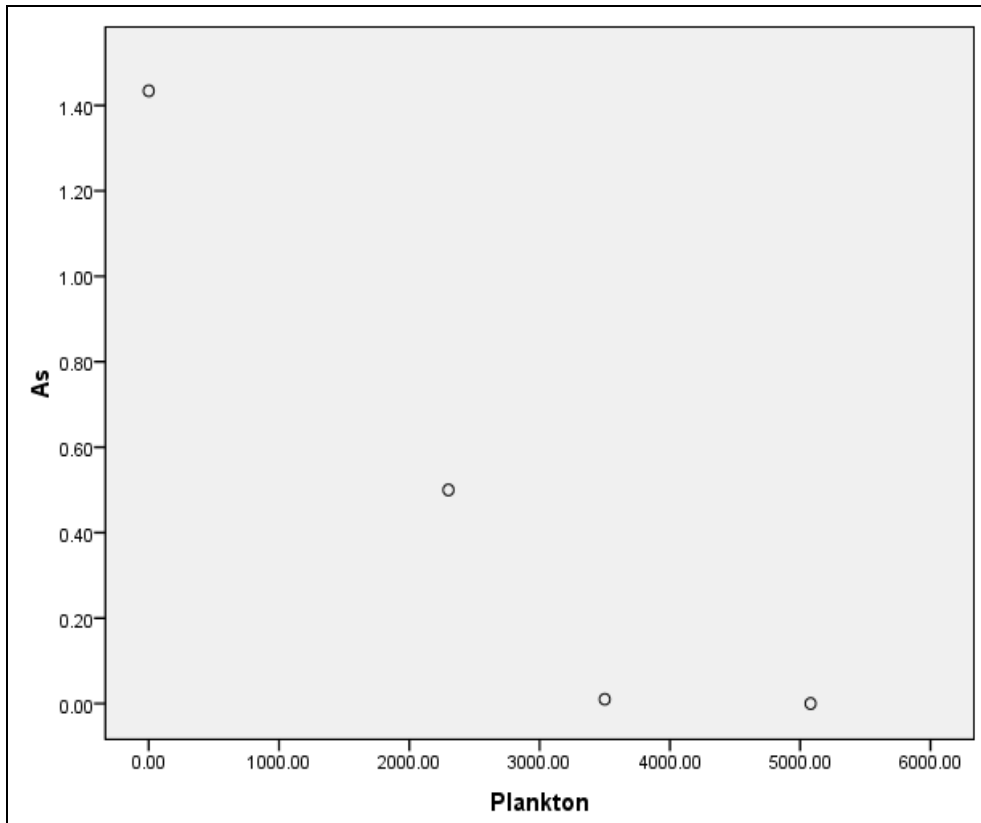


Fig 3: Hydroponics Aquaculture medium having Arsenic and its compounds and separation with Plankton Populations for stochastic model derivations Nanobiotechnology, Arsenic removal techniques, Plankton population, Environmental-editing, hydroponic techniques to make arsenic free foods

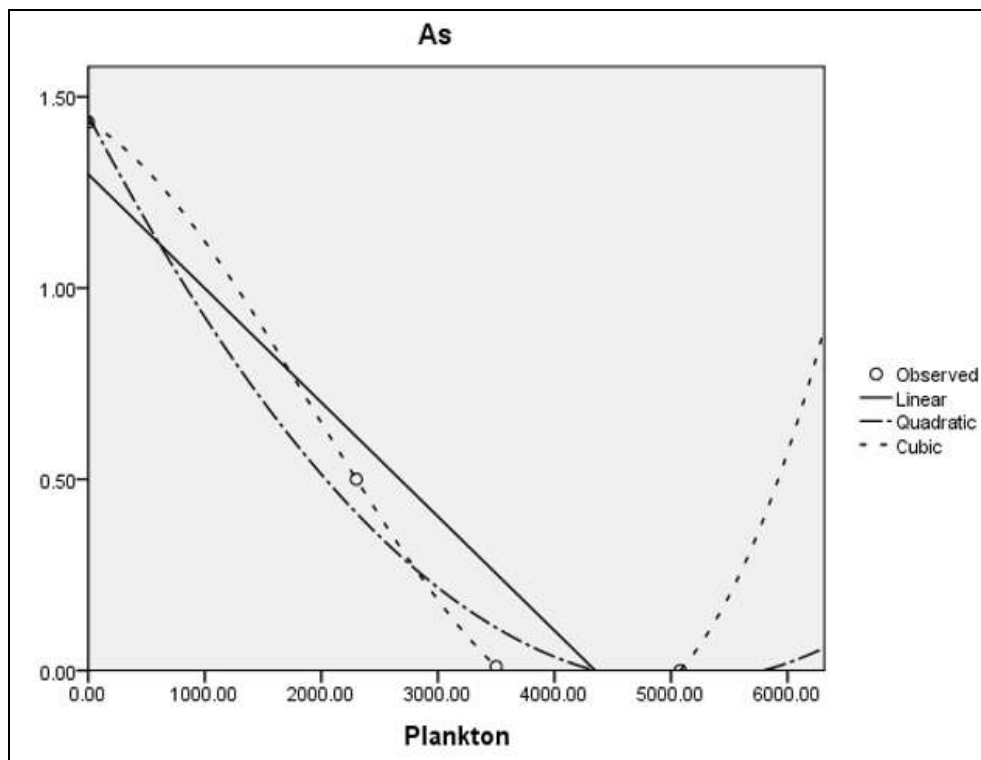


Fig 4: Hydroponics Aquaculture medium having As removal with sieving with plankton populations and stochastic models with Nanobiotechnology of Arsenic removal techniques of Plankton population assisted hydroponic techniques to make arsenic free foods

Table 1: Hydroponics Aquaculture medium having As removal with sieving with plankton populations and stochastic models with parameters with Nanobiotechnology of Arsenic removal techniques with Plankton population assisted with hydroponic techniques to make arsenic free foods

Stochastic Model Equations of Arsenic concentration (ppm) Vs Plankton Counts									
Dependent Variable: As									
Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	.821	9.204	1	2	.094	1.194	.000		
Logarithmic ^a	.	.	.	.	.	.	.
Inverse ^b	.	.	.	.	.	.	.
Quadratic	.998	240.497	2	1	.046	1.445	.000	7.010E-8	
Cubic	1.000	.	3	0	.	1.434	.000	9.077E-9	7.439E-12
Compound ^c	.	.	.	.	.	.000	.000		
Power ^a	.	.	.	.	.	.000	.000		
S ^b	.	.	.	.	.	.000	.000		
Growth ^c	.	.	.	.	.	.000	.000		
Exponential ^c	.	.	.	.	.	.000	.000		
Logistic ^c	.	.	.	.	.	.000	.000		
The independent variable is Plankton.									

- The independent variable (Plankton) contains non-positive values. The minimum value is .00. The Logarithmic and Power models cannot be calculated.
- The independent variable (Plankton) contains values of zero. The Inverse and S models cannot be calculated.
- The dependent variable (As) contains non-positive values. The minimum value is .00. Log transform cannot be applied. The Compound, Power, S, Growth, Exponential, and Logistic models cannot be calculated for this variable.

Conclusions

We may know that Plankton cells are predominantly recommended in filtering Arsenic compounds with nano biotechnology modes hence hydroponics of plankton can produce arsenic free and safe foods (Fig. 1 to Fig. 5). Plankton population can be generated within shortly say around 7 days in a synthetic aquaculture tank and having hydroponic medium. National flower Lotus seldom have Arsenic problem owing to planktonic sieving Arsenic compounds sieving naturally. Present research communication dealt some induction process of Arsenic removal with nano-biotechnological method of Arsenic removal techniques with Plankton population relates to environmental-editing way of hydroponic techniques to make arsenic free and safety foods in many long years to come. There may be a least panicking in fisheries may be since In usual natural fisheries there may not be any alarming situations as many planktivore fish species can release Arsenic compounds some extent through excreta while major concern Arsenic compounds may be the terrestrial sources.

Acknowledgements

First author is grateful to the HOD FRAI Division, ICAR-Central Inland Fisheries Research Institute, Barrackpore for accomplishments and also thankful to the Director, ICAR-CIFRI, Barrackpore All concerned are also acknowledged.

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