

Report No. CEPS/RAK/860/18

Date: 08-08-2018

Name and Address of the Customer: M/S Mrs. Annie Natural Action Technology, 616 Farooq Azam Street Gali No. 2 Khuttab Shah Masjid, Lahore

Request Ref # and Date: Nil **Sheet No.** One of 8

Description of Sample: Structure water Device **No. of sample:** One

ILO Log # and Date: 635 dated 23-05-2018 **Ref/Code #** CEPS/860/18

Method used Specs: Standard Methods for the Examination of Water and Wastewater, 21st Edition, 2005 **Temp. & Humidity:** 28-37 °C
32-65 %

Statement of non compliance: Nil **Testing date:** 01-06-18 to 24-07-18

RESULTS

Sr. No	Tests and Parameters*	Results	Device Efficiency
1.	Increased Seedlings Sprout Growth	42% seeds growth in treated water 33% seeds growth in control water	27%
2.	Reduced pathogens, anaerobic & aerobic	Pathogen Inhibition 30% in Treated Milk 25% in Control Milk	20%
3.	Increase Root Length	26% in treated water 23% in control water	13%
4.	Dissolved Oxygen increase	7.3ppm oxygen in treated water 7.8ppm oxygen in control water	7.0 %

*=The detail of each test/parameter is described in attached technical report

◆-----◆ **END** ◆-----◆

EFFICIENCY OF STRUCTURE WATER DEVICE

Our worthy client has claimed that normal tap water after passing through his provided Structure water device will be improved in following manner:

- Improved biological function
- Reduce water use
- Less system maintenance
- Longer system life
- Improve taste and feel water, wine, juices and milk
- Increase preservation without preservatives
- Increase oxygen reduce anaerobic bacteria

For evaluate and cope the above mentioned claims we have done following parameters through a number of experimentations:

- Increased seedlings sprout growth
- Reduced pathogens ,anaerobic & aerobic
- Increase root length
- Dissolved oxygen increase



Figure 1: Structure water preparation from given device (Flow rate 12 drops/min)

The provided Structure water device's efficiency was calculated through a number of experimentations. The Control Tap Water was passed through the Structure water device and the out flow rate was 12 drops per minute. The treated Structure Water was stored for further nine studies & experimentations for evaluation of provided device.

STUDY 1, INCREASE IN SEEDLING AND SPROUT GROWTH

These tests were designed to find out the effects of irrigation of seeds with regular Control Tap water and after activation as Treated Structure Water. Plants were sowed indoors under the room temperature and irrigated with equal amount of control and treated water. We have apply This Experimentation were conducted in triplicate and maintained equal watering and environment conditions for 10 days.

Experiment No. 1:

Wheat seeds were grown in petri plates .After that equal amount of Treated Structure water and Control Tap water were poured into petri plates.

After 3 days 42% seeds have started germination in treated and 33% in control and after 6 days it

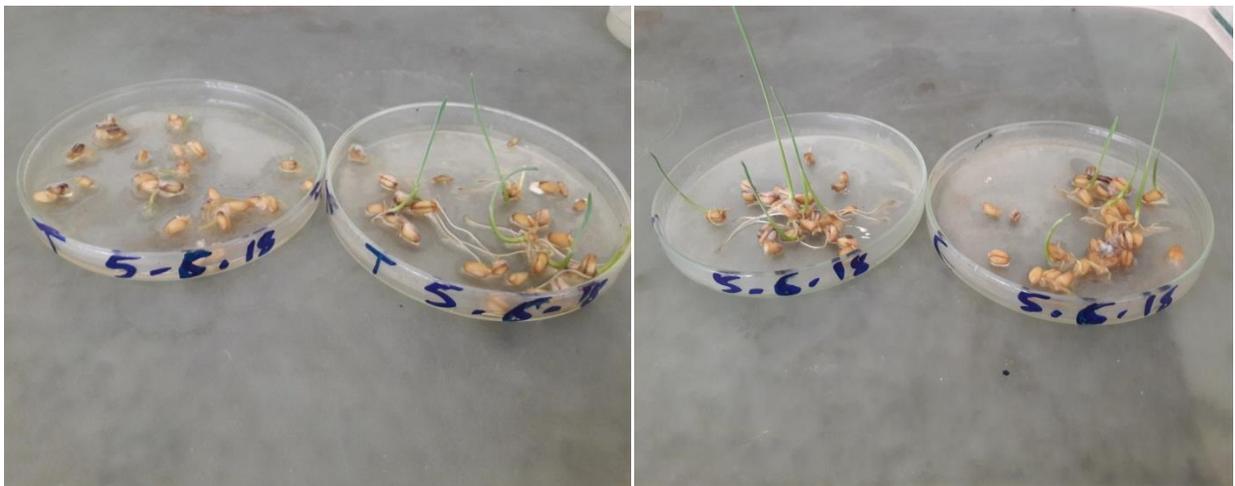


Figure 2: Wheat Seedling and sprout growth in treated structure water and control tap water was observed number of seed sprouted and length of seedling were greater in treated as compared to control .

Experiment No. 2

Gram seeds were grown in petri plates and equal amount of Treated Structure water and Control Tap water were given to these petriplates. After 3 days 40% Gram seeds started germination in treated and 29% in control and radical & plumule were clear in sprouted seeds in treated water. After 6 days number of seed sprouted and length of seedling were greater in treated as compared to control.



Figure 3: Gram Seedling and sprout growth in treated structure water and control tap water

Experiment No. 3

Pulses seeds were plugged in cotton in petri plate's .After that equal amount of Treated Structure Water and control Tap water.

After 3 days 25% pulse seeds were started germination in treated and 8% seed in control and after 6 days number of seed sprouted and length of seedling were greater in treated as compared to control .

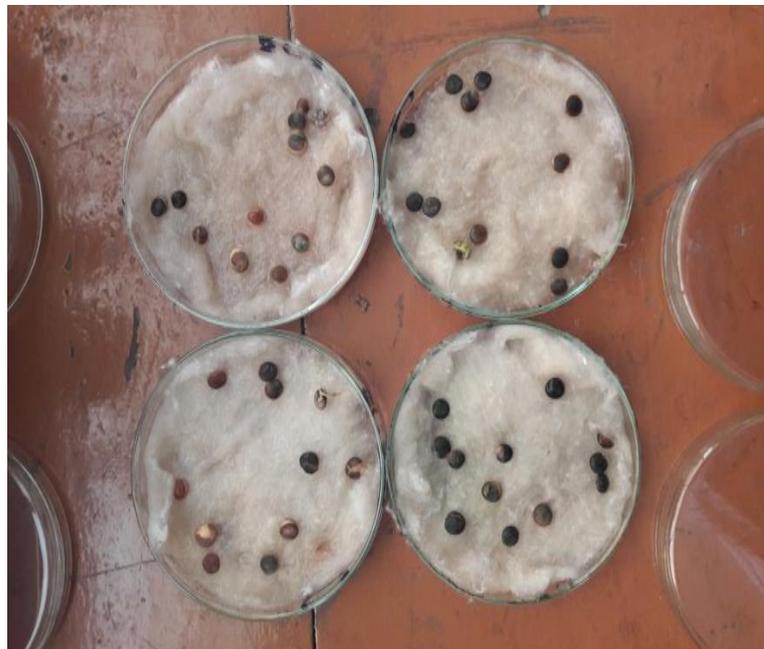


Figure 4: Pulse Seedling and sprout growth in treated structure water and control tap water

Conclusions:

In Treated structure water seed germination and sprouting started earlier as compared to control Tap water and the number of seed germinated and seedlings length were also greater in treated water as compared to control.



Figure 5: Preparation of treated milk after passing through device 12drops/min

STUDY 2, REDUCTION IN PATHOGEN (AEROBIC & ANAEROBIC)

To study microbial activity we select equal volume of raw milk was selected without boiling .One portion was taken as such and as control and to other part we pass milk through provided device. The flow rate was 12 drops per minute

Experiment No. 1 (Aerobic):

At the start of experiment and after 4-6 days Treated milk was good for resisting fungal attack and it was rather clear, on the other hand orange fungi colonies were appeared on control milk.



Figure 6: Control and Treated milk for aerobic microbial activity at 4th day

Experiment No. 2 (Anaerobic):

For anaerobic pathogen conditions after 4-6 days both treated and controlled samples of milk were



Figure7: Control and Treated milk for anaerobic microbial activity

remained in same condition as water and white sediments.

Conclusions:

There is slightly resistance found to fungus in Treated milk in aerobic condition as compared to untreated milk. Untreated milk got fungus earlier than treated milk, so device is 20% efficient. In anaerobic conditions, milk before and after passing through Structure water device is same.

STUDY 3, INCREASE IN ROOT GROWTH

It was claimed that after passing through device, the root growth and length will be improved. So experiments were designed with onion bulbs and mint plants.



Figure 8: Increased root growth in tap and structure water with onion bulbs

Experiment No. 1:

The Onion bulbs were subjected to Experiment for root growth. The onion bulbs were exposed and dipped into treated structure water and Control Tap Water towards their roots. This experiment lasts for 5 weeks. It was found that there was growth in number and length of roots of onion bulbs after 4 weeks are shown in fig 10.

Experiment No. 2:



Figure 9: Increased root growth in tap and structure water with mint plants



Figure 10: Increased root growth in Treated structure water with onion bulbs

In another experiment mint shoots were dipped in Control Tap Water and Treated Structure Water. After 4 week, improvement was found in plant roots dipped in Treated Structure water.

Conclusion:

There is little bit increase in root growth 13%, improvement in number and length of roots is found in onion bulb and < 13 % in mint roots after 30 days.

STUDY4 , INCREASE IN DISSOLVED OXYGEN (DO)

Dissolved oxygen is an important parameter of clear drinking water.

The dissolved oxygen (DO) is oxygen that is dissolved in water. The oxygen dissolves by diffusion from the surrounding air; aeration of water that has tumbled over falls and rapids; and as a waste product of photosynthesis. Fish and aquatic animals cannot split oxygen from water (H₂O) or other oxygen-containing compounds.

Biologically speaking, however, the level of oxygen is a much more important measure of water quality than fecal coliform. Dissolved oxygen is absolutely essential for the survival of all aquatic organisms (not only fish but also invertebrates such as crabs, clams, zooplankton, etc). Moreover, oxygen affects a vast number of other water indicators, not only biochemical but esthetic ones like

the odor, clarity and taste. Consequently, oxygen is perhaps the most well-established indicator of water quality.

Experiment:

The dissolved Oxygen in Control Tap Water and Structure Treated Water was done with the Reference method in American Public Health Association 2012 Method no. 4500-O,C

Dissolved Oxygen of Control Tap water 7.3mg/L

Dissolved Oxygen of Treated Structure water 7.8 mg/L

Conclusion:

There is 6.85 % (7.0 %) improvement in Dissolved Oxygen after treatment through Structure water device.
