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Date : 16-05-2017

A comparative study on the effect of Aquaguard 'Biotron' treated water on seed germination by using Maize (Zea mays).

Objective: To study the effect of Aquaguard Biotron treated water (Magnetized water) and tap water so as to compare the 'bioavailability' of water inside the seed and its germination.

Test Procedure:

Materials:

1. **Micro lab Petri plates:** 6 Nos - 3 sets for tap water samples and 3 sets for Biotron water
2. **Surgical cotton:** Equal weight for both samples. This is for the absorption of water and to maintain humidity.
3. **Seeds:** Select healthy seeds equal size and weight. Ideally select wheat or Ragi or maize
4. **Sample water:** Tap water and biotron water from Dr. Aquaguard Magna RO+UV. Use always fresh water both from tap and Magna. Maintain the pH of the water samples 7-8 for better result.

Environmental condition: Ideally 25 to 30 degree Celsius ambient temperature and relative humidity > 60% .Do not run the experiment in high ambient temperature. This may delay the germination of seeds.

Test procedure

- **Seed preparation:** Wash the seeds with sterilized water to remove fungus spores and clean with sterile tissue paper.
- Soak the seed for 3 hrs in respective water samples
- Arrange 3 set of petri plates for tap water and 3 sets for Dr. AG Magna RO+UV (Biotron) water. Clean the petri plates with distilled water and label clearly.
- Put 3 gms of clean cotton in to each petri plates and make a uniform layer.
- Add 40 ml tap water to the first 3 set of petri plates & 40 ml biotron water to the other 3 set of petri plates to soak the cotton. Drain the excess water from petri plates (do not press the cotton layer).
- Take the soaked seeds and place it on wet cotton bed - 10 nos. in each petri plate. Give space between the seeds
- Keep the petri plates in a clean, sterile environment ideally at 25 to 30 degree Celsius ambient temperature & > 60% relative humidity.

A handwritten signature in blue ink, appearing to read 'Durga Prasad Barik'.

Dr. Durga Prasad Barik

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- Sprinkle water if required, with respective water sample (equal quantity in each plate).
- Measure the environmental parameters like humidity, temperature and quantity of water used.

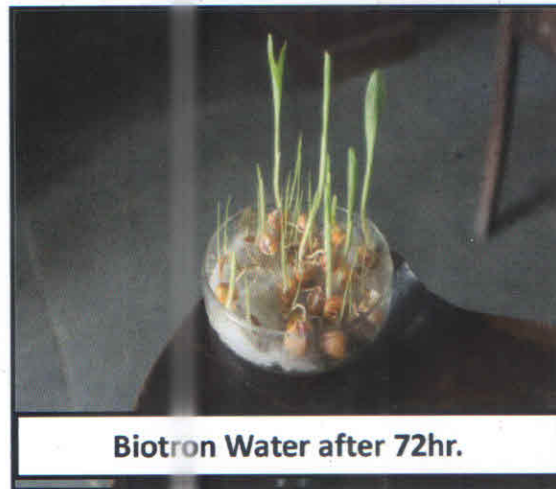
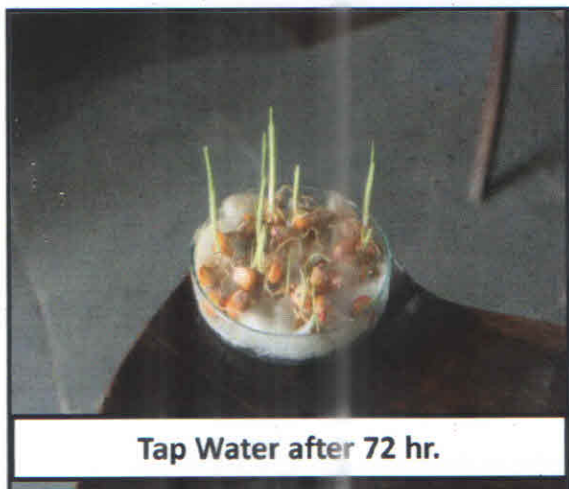
Observation: Observe and record the no. of seeds germinated in each plate after 18 hrs, 24 hrs, 36 hrs, 48 hrs, 60 hrs & 72 hrs. Take photographs of the seeds morphology during each observation. Also record the environmental parameters

Biotron-Mineral Absorption Technology was tested for cellular absorption in seeds, in the M.Sc. Biotechnology laboratory P.G. Dept. of Botany, Ravenshaw University under my supervision.

The healthy seeds of Maize were obtained from market. Dr.Aquaguard Magna HD RO+UV product outlet water was used, which was incorporated with Biotron (Magnetron) technology for producing the magnetized water. The test conducted at room temperature 27 & humidity 70. The results obtained are given below in the table.

SEED GERMINATION STUDIES-I

Observation - Seed-1 (Maize)									
Time Duration	No. of seeds in each plate	No. of seeds germinated in Tap Water				No. of seeds germinated in Biotron Water			
		Plate-1	Plate-2	Plate-3	Average %	Plate-1	Plate-2	Plate-3	Average %
After 18 hours	10	2	1	2	16.66	2	2	3	23.33
After 24 hours	10	4	3	3	33.33	4	4	6	46.66
After 36 hours	10	8	7	8	76.66	9	8	10	90.00
After 48 hours	10	9	8	9	86.66	10	10	10	100.0
After 60 hours	10	10	10	10	100.0	10	10	10	100.0
After 72 hours	10	10	10	10	100.0	10	10	10	100.0



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Table - II

Average Shoot and Root length							
Time Duration	Normal Water				Biotron Water		
	Seed Name	Shoot Length (mm)	Root Length (mm)	Leaf size(mm)	Shoot Length (mm)	Root Length (mm)	Leaf size(mm)
After 24 Hours	Maize	0.0	3.0	0.0	0.0	7.0	0.0
After 48 Hours		25.0	11.0	1.0	45.0	19.0	3.0
After 72 Hours		44.0	18.0	3.0	72.0	28.0	6.0

SEED GERMINATION STUDIES-III-

Ratio of water absorption study on different seeds soaked in tap water and biotron water in terms of its weight.

Sl. No.	Name of the Seed	Type of water	Wt of dry seeds	Wt after 1 hr.	% Wt increase	Wt after 3 hrs	% Wt increase	Wt. after 6 hrs	% Wt increase
1	Maize	Tap water	6.765	8.224	21.57	10.412	53.90	13.522	99.88
		Biotron water	6.811	9.125	33.97	12.225	79.48	15.451	126.85

Summary:

The above study clearly confirmed that Biotron treated water is very penetrating due to the impacts of magnetic field treatment and converted them into micro clustered water. Water absorption by dry seed became very fast in biotron water compared with the normal tap water. Due to bio availability of water inside the seed, it germinated better than the tap water treated seed. To conclude that Biotron water is superior and fast penetrating to the cells and hydrating the cells faster than normal water which tends the faster growth in seed germination.

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