

## TM 743 - INORGANIC SALT MEDIUM (MODIFIED RAGGIOS MEDIUM)

### INTENDED USE

For studying soil microorganisms such as *Rhizobium* species.

### PRODUCT SUMMARY AND EXPLANATION

Rhizobia are nitrogen-fixing bacteria, which live freely in soil and in the root region of both leguminous and non-leguminous plants. These bacteria are capable of forming complex symbiotic relationships with only leguminous plants. In an effective symbiosis, the bacteria infect the plant roots and induce the formation of specialized structures called nodules. In the nodules, the bacteria multiply, form specialized cells called bacteroids and subsequently convert atmospheric nitrogen to ammonia.

### COMPOSITION

Ingredients	Gms / Ltr
Calcium carbonate	3000.000
Calcium chloride hexahydrate	446.000
Potassium chloride	165.000
Potassium dihydrogen phosphate	200.000
Magnesium sulphate heptahydrate	700.000
Sodium sulphate	200.000
Potassium iodide	0.750
Ferric chloride hexahydrate	2.500
Boric acid	1.500
Sodium molybdate dihydrate	0.250
Manganese sulphate tetrahydrate	6.640
Zinc sulphate heptahydrate	2.670
Copper sulphate pentahydrate	0.070

### PRINCIPLE

Energy for the reduction of nitrogen is provided by the plant, through photosynthesis and the resultant product provides a nitrogen source for the plant. Inorganic Salt Medium modified as per Bunting and Horrocks is used for studying and isolation of soil microorganisms, such as *Rhizobium* species. Calcium stimulates nodulation when present as chloride or sulphate. Molybdenum is essential for symbiotic nitrogen fixation and stimulates the nitrogen fixing activity of the nodular tissue. Inorganic Salt Medium is used to moisten the sand (or used as such) into which the suspended roots grow.

### INSTRUCTION FOR USE

- Dissolve 4.14 grams in 1000 ml purified/distilled water.
- Heat just to boiling.
- Sterilize by autoclaving at 15 psi pressure (121°C) for 15 minutes.
- Mix well and dispense as desired.

Note: Due to presence of calcium carbonate, the medium forms opalescent solution with white precipitate.

### QUALITY CONTROL SPECIFICATIONS



**Appearance of Powder** : White to light yellow homogeneous free flowing powder.  
**Appearance of prepared medium** : Light yellow clear solution with heavy white precipitate at bottom.

### INTERPRETATION

Cultural characteristics observed after an incubation.

Microorganism	ATCC	Inoculum (CFU/ml)	Growth	Incubation Temperature	Incubation Period
<i>Rhizobium leguminosarum</i>	10004	50-100	Luxuriant	25-30°C	Upto 7 days
<i>Rhizobium phaseoli</i>	14482	50-100	Luxuriant	25-30°C	Upto 7 days
<i>Rhizobium trifolii</i>	14480	50-100	Luxuriant	25-30°C	Upto 7 days

### PACKAGING:

In pack size of 100 gm and 500 gm bottles.

### STORAGE

Dehydrated powder, hygroscopic in nature, store in a dry place, in tightly-sealed containers between 25-30°C and protect from direct sunlight. Under optimal conditions, the medium has a shelf life of 4 years. When the container is opened for the first time, note the time and date on the label space provided on the container. After the desired amount of medium has been taken out replace the cap tightly to protect from hydration.

**Product Deterioration:** Do not use if they show evidence of microbial contamination, discoloration, drying or any other signs of deterioration.

### DISPOSAL

After use, prepared plates, specimen/sample containers and other contaminated materials must be sterilized before discarding.

### REFERENCES

- Balows A., Truper H. G., Dworkin M., Harder W., Schleifer K. H., (Eds.), The Prokaryotes, 2nd Edition, Vol. III, Springer-Verlag.
- Bunting A. H. and Horrocks J., 1964, Ann. Bot., 28:229.
- Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
- Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
- Subba Rao N. S., 1977, Soil Microorganisms and Plant Growth, Oxford and IBH publishing Co., New Delhi.



 GMP Good Manufacturing Practices Certified	 Best Before	 Quantity	 Catalogue Number	 Manufacturer
 Temperature Unit	 Lot / Batch Number	 Consults Instructions for Use	 QR Code	

**NOTE:** Please consult the Material Safety Data Sheet for information regarding hazards and safe handling Practices.

**\*For Lab Use Only**  
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