

## Significance of Technology

- ❖ Useful for day-to-day microbiology laboratory research and diagnostic work.
- ❖ Useful for culturable microbial screening and purification purposes.
- ❖ Suitable for the microbial PGP traits assessment.
- ❖ Economic as compared to existing commercial media (Table 1).
- ❖ Eco-friendly.

Table 1. Cost analysis of NRRI-AzoMedia (NAM) compared with commercially available regular used media.

Media	Expenditure/litre media (Rs)*	Differential value (Rs/litre) of media compared to NAM	% surge of media compared to NAM
NRRI-AzoMedia (NAM)	112.3	0	0%
Nutrient agar medium	166.9	54.6	32.7%
Luria-Bertani agar medium	331.4	218.9	66.1%
Potato dextrose rose Bengal agar medium	171.29	58.9	34.5%
Potato dextrose medium	276.6	164.3	59.4%

\*Approximate price as per the present market value

# NRRI-AzoMedia (NAM)

## *A microbial-growth culture media*

Upendra Kumar, Megha Kaviraj, P Panneerselvam and AK Nayak



Preparation of microbial-growth culture media from plant extracts is becoming popular nowadays. Plant-extracts are useful and well suited for microbial-growth because they contain all necessary nutrients, growth factors, amino acids, vitamins and minerals. Therefore, *Azolla*-based microbial culture media “NRRI-AzoMedia” (NAM) was developed to assess the microbial-growth and to evaluate their functional attributes and compared with respective commercial media. *Azolla* is a known aquatic fern and having rich source of nutrients like crude protein (18.6-25.9%), lipid (ether extract, 2.9-4.6%), total sugar (6.27-7.66%), antioxidant (53.2-76.9%), calcium (0.62-2.21%), phosphorous (0.65-1.03%) and all essential micronutrients. The fast multiplication rate (doubled within 2-3 days) of *Azolla* is another important and additional feature making it suitable for developing microbial-growth media. The medium can be used for cultivating and maintaining microorganisms and this can also be used for purity checking prior to biochemical testing. This is a comparatively simple cost effective as compared to several commercial media. The NAM can be used for the microbial studies of diverse environmental samples. It could also be used for the cultivation and enumeration of specific macro- and micro-nutrient utilizing bacteria by addition of particular substrates. NAM provides the necessary nitrogen compounds, carbon, vitamins and also some trace ingredients necessary for the growth of microorganism. This media can be useful for day-to-day microbiology laboratory research, diagnostic work and can able to reduce 30-60% expenditure from the known commercial media.

## NRRI-AzoMedia (NAM)

### *A microbial-growth culture media*

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## Technology description

### Composition\*

- ❖ Azolla powder, NaCl, Yeast extract and Agar.

\*Formula is standardized and adjusted to suit performance parameters.  
(Exact quantitative composition is kept secret for patent purpose)

### How to use

- ❖ Suspend 27.5 g in 1000 mL purified/distilled water.
- ❖ Heat to boiling to dissolve the medium completely.
- ❖ Sterilize by autoclaving at 15 lbs pressure (121 °C) for 15 minutes.
- ❖ Cool to 45-50 °C.
- ❖ Mix well and pour into sterile Petri-plates.

### Type of samples analysis

- ❖ Environmental samples (soil, water and plant).

### Performance and evaluation

- ❖ Performance of the NAM is expected when used as per the direction on the label within the expiry period and stored at proper ambient condition.

### Quality control

- ❖ Appearance of NAM: Light green homogeneous free flowing powder.
- ❖ Gelling: Firm and comparable with 1.5% Agar.
- ❖ Colour and clarity of prepared medium: Light green colour clear gel forms in Petri-plates.
- ❖ pH of the media:  $7.20 \pm 0.20$ .

### Cultural response

- ❖ Microbial culture growth is observed on NAM after incubating it at 25-35 °C for 1-4 days.

### Precautions

- ❖ Store between 10-30 °C in a tightly closed container and the prepared medium at 20-30 °C.
- ❖ Use before expiry date (12 months).
- ❖ On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation.
- ❖ Improper storage of the product may lead to lump formation.
- ❖ Seal the container tightly after every use.

### Salient features of the technology

- ❖ NAM is an exclusively plant-based media for microbial growth.
- ❖ Growth of bacteria, fungi and their functional traits (phosphate solubilisation, ammonia, indole acetic acid and HCN productions) were *at par* on NAM compared to commercial media.

- ❖ Shelf-life of NAM is 12 months under ambient temperature.
- ❖ NAM is cheaper by 32.7-62.7% compared to known commercial media for microbial culture.
- ❖ Easy to handle.
- ❖ Eco-friendly.

### Technology Validation

- ❖ The NAM has been screened for microbial growth and their plant growth-promotion attributes. It was validated at Microbiology lab of ICAR-NRRI, Cuttack for several times to check its reproducibility.
- ❖ Growth of microbes and their functional traits (phosphate solubilisation, ammonia, indole acetic acid and HCN productions) were *at par* on NAM compared to commercial media (Fig. 1).
- ❖ The presence and absence of halo for phosphate solubilization and colour appearance for indole acetic acid (light to dark pink), ammonia (orange to red), HCN (yellow to reddish brown) are visualized for the positive results (Fig. 1).

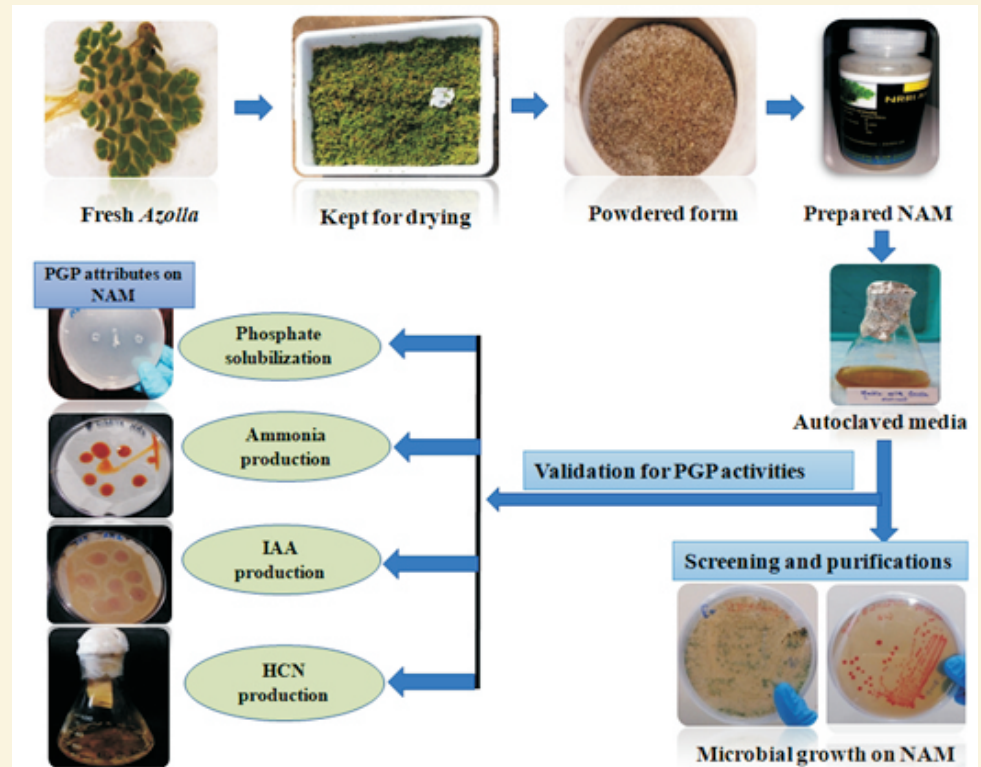


Fig. 1. Assessment of plant growth-promoting traits on NRRI-AzoMedia (NAM) media.