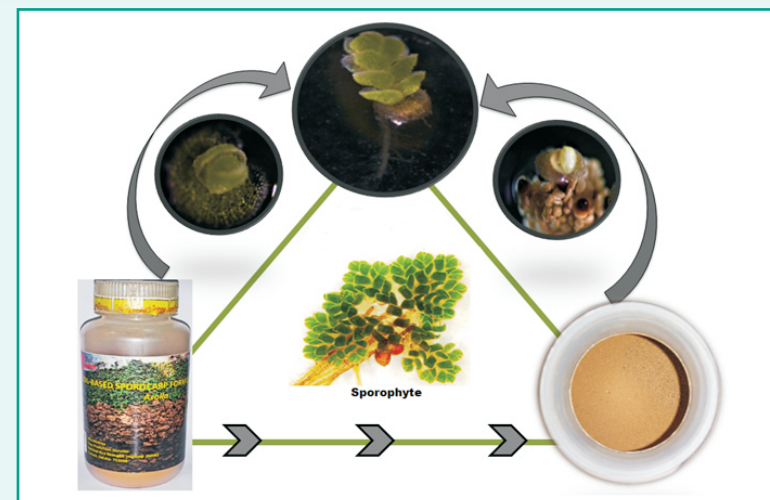


# NRRI-Azolla-sporocarp Formulation for Nitrogen-management in Low land Rice

Upendra Kumar, Megha Kaviraj, Snehasini Rout, P Panneerselvam and AK Nayak



*Azolla* is a free-floating aquatic fern and known biofertilizer for lowland rice as it fixes nitrogen from atmosphere with help of cyanobacteria, which resides exclusively in its dorsal leaf pocket. Though, it is a well established biofertilizer still it has not become popular and reaches among large farming community due to requirement of its huge primary inoculums (2-5 t/ha). Even transportation of its bulk amount for *ex-situ* application and maintenance leads to higher costs to the farmers. Hence, a technology has been made to reduce its initial inoculum load by developing sporocarp-based *Azolla* formulation (Fig. 1). Altogether 23 strains of sporocarp-producing *Azolla* are identified among 102 strains of *Azolla* germplasm, conserved and maintained at NRRI, Cuttack round the year. Carrier-based sporocarp formulation ( $50 \pm 10$  spores/g product) is developed to reduce its bulk inoculum. This sporocarp-based *Azolla* technology may considerably reduce the quantity of its primary inoculum and ease the application in lowland rice production.

## Technology Description

- ❖ Fresh *Azolla* sporophytes (5 kg) are collected from the field during winter months (January-February).
- ❖ It is transferred into pots containing 5 kg of soil.
- ❖ Maintains 5 cm water level until sporocarp maturation.
- ❖ Then water is removed using a mosquito net as a strainer and heaped to form a sporocarp-compost.

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- ❖ Compost with surface soil is collected and makes it powder form.
- ❖ It is then passed through different mesh sizes (710, 353 and 180 microns) of strainer to obtain desired sporocarp formulations.
- ❖ Prepared sporocarp formulation is kept in water for germination.
- ❖ Emerged new *Azolla* plant is visible after 15 days of incubation period under favourable condition (Fig. 2).

## How to Use

- ❖ Suspend 5 g of sporocarp formulation in 250 mL water containing vessel.
- ❖ Keep the container under ambient condition (Temp. 37 °C | 25 °C, day length 11 h 25 min. and night length 12 h 34 min.).
- ❖ After 4-5 days, masullae emerged out from fused sporocarp zygote.
- ❖ Keep for another 3 days to complete emergence of newly *Azolla* plant.
- ❖ Carefully transfer the germinated plant to earthen pot containing fresh soil and 10-12 cm labelled water for free floating and growth by uptaking nutrients from soil.
- ❖ After complete propagation, *Azolla* now ready for multipurpose usage.

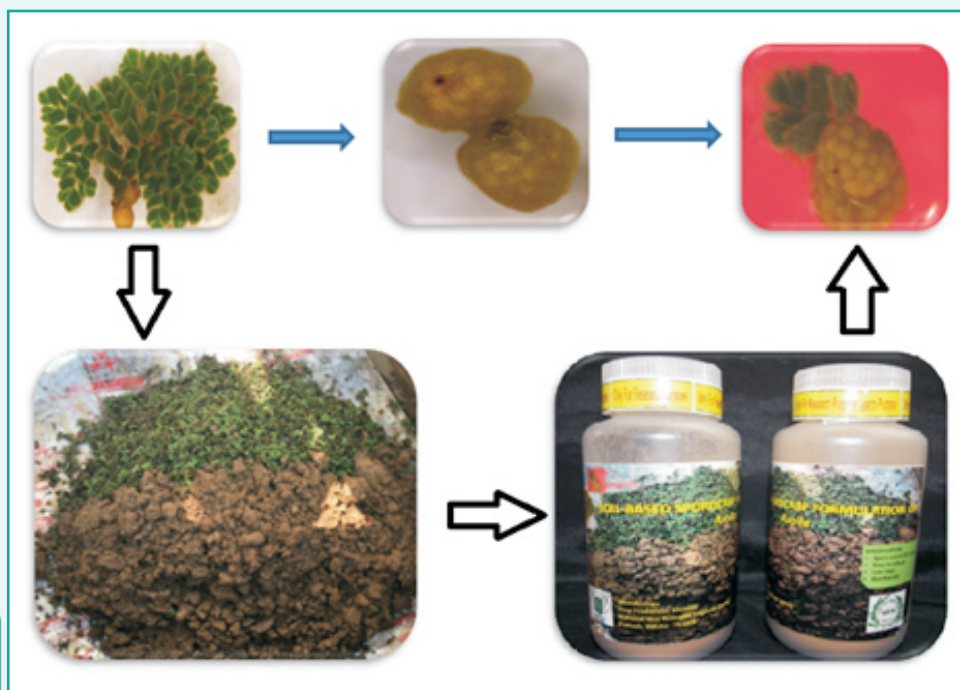


Fig.1 Preparation of soil-based *Azolla* sporocarp for low land rice.

## Precautions

- ❖ Store between 10-30 °C in a tightly closed container.
- ❖ Use before expiry date (upto 12 months).
- ❖ On opening, product should be properly stored.
- ❖ Improper storage of the product may lead to retard the germination event.
- ❖ Get best result only during recommended conditions.
- ❖ Do not add any chemical amendment during germination process which may lead to hindrance for germination.
- ❖ Mechanical stress should be avoided.

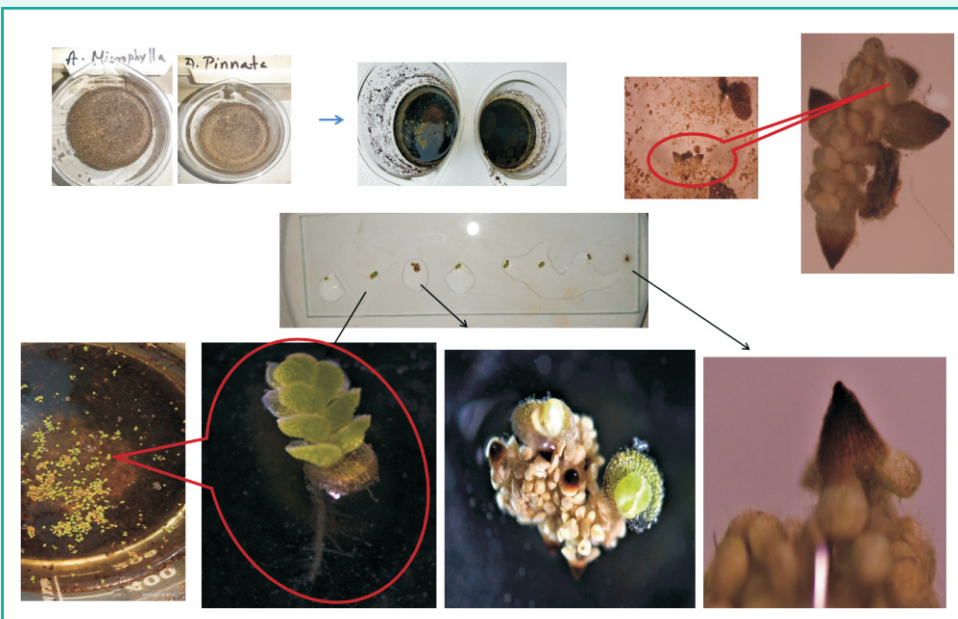


Fig. 2 Validation of NRRRI *Azolla*-sporocarp formulation at ICAR-NRRI, Cuttack, Odisha.

## Significance of Technology

- ❖ Potential nitrogen biofertilizer for lowland rice production.
- ❖ Shelf-life is 12 months under ambient storage condition.
- ❖ Reduce bulk inoculums dose (50 ± 10 spores/g product).
- ❖ Grown up *Azolla* seed material could be used as biofertilizer and as well as for livestock feed.
- ❖ Less prone to degrade under moisture stress.
- ❖ Ease application may popularise rapidly among farming community.
- ❖ User-friendly.
- ❖ Economic.