Rice as Medicine

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Rice consumption is assumed to be associated with increase in the incidence of diabetes in the rice eating zones of the country.

The increased sugar levels in diabetes are attributed to carbohydrates, which could include starches from white rice.
A study of ~230 rice varieties worldwide showed that Indian rices are within recommended Glycemic index

Glycemic index measures the ability of a food substance to raise blood sugar levels after eating.

Foods with a high glycemic index of 70 and above cause blood sugar levels to peak within a short period of time, damaging blood vessels and nerves.

Foods with a medium (below 69) or low glycemic index (below 55) are better options for diabetics.
Generally white rice has a glycemic index between 72 - 83

Brown rice GI 48 - 62

Basmati rice GI 78 – 74

Most of the Indian rice varieties GI ~50 (<60)

Swarana and Mahsuri GI 55

Resistant starches play a role in GI
Though alternate foods are suggested/adopted, the satiety (satisfaction) of rice consumers can be full with low GI rice or brown rice.

Health aware and diabetes prone rice consumers can switch their rice based diet to low GI rice.

Biofortified rice with high zinc and iron is also being developed.

Several ‘Diabetic’ rices are available in market, but their bio efficacy need to be certified with competent government body.
Rice in addition to being staple food crop in India is also known for its medicinal values

Some selected varieties used in specific treatments

- **Aalcha, Nagkesar, Kari bhatta**
  - Skin problems
- **Atikaya**
  - Health tonic
- **Kanthi Banko**
  - Medicinal properties
- **Chinta puvvu, Paccha ganneru**
  - Nutritional & medicinal value
- **Gathuran**
  - Arthritis, Rheumatism
Some popular medicinal rice varieties

Gathuran- arthritis
Aalcha’ - pimples
Maharaji - strength and stamina to ladies post delivery
Baisoor – epilepsy; headache, boils, skin diseases, ringworm infections, conjunctivitis
Laicha – Pre pregnancy

Other popular medicinal rices

<table>
<thead>
<tr>
<th>Jhilli</th>
<th>Udan Pakheru</th>
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<tbody>
<tr>
<td>Ramakeli</td>
<td>Shyam Lal</td>
</tr>
<tr>
<td>Tenduphool</td>
<td>Kalama</td>
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<tr>
<td>Pundarika</td>
<td>Panduka</td>
</tr>
<tr>
<td>Sugandhalaka</td>
<td>Kardamaka</td>
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<tr>
<td>Maetunaka</td>
<td>Mahasali</td>
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Of all medicinal rices, Njavara is the single largest used rice for medicinal purpose.

Njavara rice cultivation is geographically restricted to Kerala (GEOGRAPHICAL INDEX).

The rice in good demand and its present market value is eight to ten folds higher than that of normal rice (Rs 350-400 kg).
Njavara is used in ‘njavarakizhī’ (an Ayurvedic treatment for neural disorders) and ‘marunnukanji’ (in the preparation of a replenishing health drink).

Njavara based treatments form one of the key elements in Ayurveda tourism in Kerala and elsewhere.

Njavara rice is also made as powder and eaten with milk as breakfast cereal.
- Susrutha samhita (*Circa 400 BC*)
- Charakasamhitha (*Circa 100 BC*)
- Ashtanga Hrudayam (*Circa 300*)

- Short duration (= 60 days) - *Shashtika*
- S. Indian languages - *Njavara*
- Geographically restricted to Kerala
- Several treatment systems in Kerala
- Grains both medicinal & nutritive

- Few thin culms
- Short panicle
- Small grains

- *Njavarakizhi*
- *Njavaratheppu*
- Neurological disorders
- Muscle wasting

- Supplementary diet
- &
- Health drink - *marunnukanji*
## Nutritional status- CFTRI

<table>
<thead>
<tr>
<th>Components</th>
<th>Njavara (% higher than normal rices)</th>
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<tbody>
<tr>
<td>Total protein</td>
<td>16.5%</td>
</tr>
<tr>
<td>Thiamine</td>
<td>27-32%</td>
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<tr>
<td>Riboflavin</td>
<td>4-25%</td>
</tr>
<tr>
<td>Niacin</td>
<td>2-36%</td>
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<tr>
<td>Dietary fibre</td>
<td>44%</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>354 mg/100g</td>
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<tr>
<td>Potassium</td>
<td>304 mg/100g</td>
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<tr>
<td>Magnesium</td>
<td>216 mg/100g</td>
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<tr>
<td>Sodium</td>
<td>30.8 mg/100g</td>
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<tr>
<td>Calcium</td>
<td>11.6 mg/100g</td>
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</tbody>
</table>

Market potential of medicinal rices in country

- 50% of Indian consumers are rice based
- Satiety with rice consumption
- Rise of consumer awareness in health foods and preventive medicine
- Availability of medicinal rices and rices with low GI

Njavara farming and GI for Njavara is a proof of concept
Status of Biofortified rice

At DRR since past 10 years, ~2000 genotypes were screened for high zinc and iron in brown and polished rice.

In Brown rice, very high zinc and iron lines are available.

But the consumer’s choice is only polished rice.

For high zinc in polished rice, several landraces and varieties were identified.
Status of Biofortified rice (contd)

Breeding lines with high zinc in polished rice are being developed not only in DRR, but also in UAS Bengaluru, TNAU Coimbatore, CRRI Cuttack and IGKV Raipur

Under AICRIP, a multilocation trial has been constituted since 2013 for identification of promising lines with high zinc in polished rice

However, promising high iron lines in polished rice were not available
Action points

• Identification of low GI rices and specific promotion of them as preferable rices for target consumers

• Clinical trials for the proof of the effectiveness of low GI rices

• Identification of medicinal rices in all states of Country and evaluation for their efficacy

• Clinical trials of medicinal rices for its efficiency

• Popularization of zinc-biofortified rices

Thank you....