

## Indian scientists develop transgenic rice that can withstand drought

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New Delhi, May 12 (India Science Wire): A group of Indian, Chinese, and Canadian scientists have developed transgenic rice that gives high yields even under severe water deficit.

The new rice variety has been developed by transferring a gene from a common plant, *Arabidopsis thaliana*, into a variety of Indian rice called *samba mahsuri*. This gene is known to be involved in pathways controlling growth and development. *Arabidopsis thaliana* is a flowering plant widely used for research purposes but it has no agronomic value as such.

Putting the *thaliana* gene into rice increased its height, length of the panicle that encloses the grain, efficiency of photosynthesis, chlorophyll content, and water use efficiency. Under water scarce conditions created in laboratory, the transgenic rice performed better than their unmodified counterparts, according to research results published in journal *Scientific Reports*.

The content of chlorophyll which is required for plants to grow reduces under stress conditions like drought, which in turn hits the yield. The transgenic rice maintained high chlorophyll content even under water-deficit and therefore performed better.



Seedlings of transgenic rice that perform better under drought conditions are seen growing in small plates in the lab (left). They grow taller compared to non-transgenic rice plants in pots with lesser water in a greenhouse (right).

“The need of extensive irrigation is a major constraint in rice production. Overexpressing TOR gene plays a major role in improving plant development, biomass, and yield potential under limited water conditions. Transgenic plants would be expected to have higher yields and better plant performance. Also, saved water, the most important ingredient in cultivation, could be utilized in the cultivation of other crops that need water and are deprived of it,” said P B Kirti, professor at the Department of Plant sciences, University of Hyderabad.

The research team included Achala Bakshi, Mazahar Moin, M Udaya Kumar, Aramati Bindu Madhava Reddy, Maozhi Ren, Raju Datla, E A Siddiq, and P B Kirti

at the University of Hyderabad and PJTS Agricultural University in Hyderabad, University of Agricultural Sciences-GKVK in Bangalore, besides scientists from National Research Council of Canada in Canada, and Chinese academy of Agricultural Sciences in Beijing, and Chongqing University in Chongqing, China. (India Science Wire)