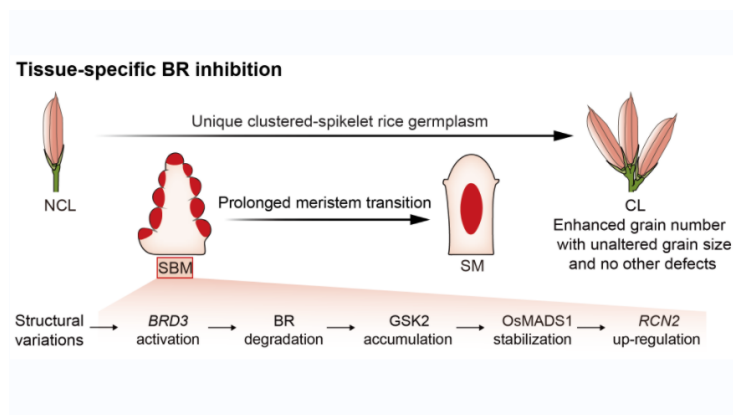


Chinese scientists decipher genetic code of double-grain rice

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Chinese scientists have made a breakthrough in agricultural science by deciphering the genetic basis behind the formation of clustered-spikelet rice. This distinctive rice germplasm resource produces multiple grains from a single position, making it highly attractive for high-yield rice varieties. The study, published in the academic journal *Science*, was led by a research team at the Institute of Crop Sciences of the Chinese Academy of Agricultural Sciences, headed by Tong Hongning.

Since the 1930s, agricultural scientists worldwide have shown interest in clustered-spikelet rice, but the specific gene controlling the cluster formation of this type of rice has not been identified. To find the target gene, the research team conducted large-scale chemical mutagenesis on clustered-spikelet rice germplasm. They created about 10,000 clustered-spikelet rice mutated lines and studied their panicles one by one in the field.

After years of study, they discovered the mechanism behind how the plant hormone, brassinosteroids (BRs), regulates the number of grains per panicle in rice. Tong said, "Our research unveils a groundbreaking role of BRs in regulating panicle branching and grain number through precise meristem transitions. Therefore, manipulating BR distribution could provide effective breeding strategies for finely tuning crop traits, ultimately boosting crop yield."

Field experiments showed that by regulating BRs, the yield of the clustered-spikelet rice can increase by 11.27 per cent to 20.96 per cent. Additionally, the team found consistent alterations in BR content in pepper and rose with clustered growth patterns, suggesting a broader role of BRs in controlling this phenotype in nature. Understanding the mechanism behind clustered-spikelet rice occurrence could offer new insights into BR function and its role in controlling similar growth patterns in various species, Tong added.

According to Lin Hongxuan, an academican at the Chinese Academy of Sciences (CAS), the cloning of related regulatory genes is difficult and has not been successful. Therefore, Tong's team's discovery is a significant breakthrough in rice research. Li Jiayang, another CAS academican, said this study provides a highly promising molecular design strategy that can help achieve high and stable crop production and ensure food security.