



Two-dimension ordinations of 330 cultivars observed in Hangzhou, China, 1983.

Possibility of transferring apomixis from sorghum to rice

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Apomixis can be exploited for the fixation of heterosis in hybrid rice. However, no cultivated or wild rice species with apomictic modes of reproduction are known. The only cereal in which a high frequency of facultative apomixis (80%) has been exploited is grain sorghum. We attempted intergeneric transfer of apomixis using protoplast fusion.

An embryogenic cell suspension culture LB-1 of rice variety T309 is available as a source of protoplasts at Nottingham University. Sorghum protoplasts can be isolated from leaves. Using standard procedures, protoplasts from the LB-1 suspension culture of T309 and mesophyll protoplasts from the apomictic sorghum line R473 were

isolated. Rice protoplasts were vitally stained with fluorescein diacetate (FDA) to facilitate identification.

After washing in electrofusion solution, protoplasts were mixed in a ratio of 1:1. Fusion was accomplished using Watts and King electrofusion equipment. Alignment of protoplasts was obtained in an AC field of 500 KHz volts for 20 s. A high frequency (6-8%) protoplast fusion was obtained with a 400 V DC pulse for 2 μ s. The mixture of unfused protoplasts and heterokaryons was plated in sea plaque agarose in petri plates, with the position of heterokaryons marked with ink dots.

Within 10-12 d, the heterokaryons had formed walls and undergone 3 divisions. There was no subsequent development.

Further manipulation of the cultural conditions (prior conditioning of the medium with T309 callus, change in the composition of the medium, nurse culture, etc.) could help realize regenerated somatic hybrids. In similar intergeneric somatic hybrids, the

genome of one parent is eliminated. It should be easy to screen progeny of regenerated rice plants for apomixis. □

Receptivity of exerted stigmas

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Experimental evidence suggests that exerted stigma traits, in particular its receptivity (probability of fertilization and seed set on spikelets with exerted stigma by artificial pollination after flowering) in CMS lines would increase outcrossing rates. We analyzed cultivars Xie-qing-zao (completely male sterile) and selections 25154 and 97154 (both partially male sterile) with exerted stigma, and Er-jiu-qing with non-exserted stigma for stigma receptivity to alien pollen at Linshui, Hainan, China, in spring 1984.