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前沿资讯

1. Nature Commun ｜ 改造农杆菌，提高植物转基因效率！

简介：近日，来自美国诺贝研究所的Kirankumar S. Mysore团队发现T3SS编码基因可在农杆菌中正常的表达，并且可用于向植物细胞内传递T3Es或者植物蛋白H2A-1，从而提高农杆菌介导的植物遗传转化效率。相关结果以Agrobacterium expressing a type III secretion system delivers Pseudomonas effectors into plant cells to enhance transformation为题发表于杂志NATURE COMMUNICATIONS上。该研究利用T3SS分泌系统对根癌农杆菌进行改造，使用改造后的菌株向植物细胞内输送效应因子T3Es或者植物蛋白H2A-1，显著提高了植物的遗传转化效率。研究结果对于克服植物的遗传转化瓶颈具有重要意义，同时本研究也建立起了一种不依赖转基因的向植物细胞投递目的蛋白的有效方式。

来源：BioArt植物

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全文链接:

http://agri.ckcest.cn/file1/M00/03/32/Csgk0YbjN-iAMczMABPGE2V2tWY491.pdf

2. Hortic Res 4月封面文章 ｜ 瓦赫宁根大学揭示甘蓝两大驯化家系及其起源地

简介：本研究利用912份全球分布的植物材料，代表了10种甘蓝变种，野生甘蓝，以及9种甘蓝的近缘野生种，进行简化基因组测序，共鉴定出14152个高质量的SNP标记。基于这些标记，系统进行了遗传多样性，群体结构，系谱树构建以及分化时间推算等相关的分析。研究表明，不同甘蓝变种间的遗传距离大于变种内部的遗传距离。花椰菜具有最小的遗传多样性，和除西兰花之外的其他变种均表现出较强的遗传分化。从基因库品种到现代杂交品种，遗传多样性在几乎所有变种中都有所降低。古特征形态重建分析表明结球甘蓝中白色品种是祖先类型，而在花椰菜和西兰花中冬季生态型是祖先类型。系统进化分析揭示了栽培甘蓝不同变种的两大主要家系：“叶球类型”家系（LHL）和“花序发育停滞类型”家系（AIL）（图1）。不同类型的羽衣甘蓝形成了多系群，表明他们之间彼此高度分化，这也符合在公元前400年左右的古文献中描述的高度多样化的羽衣甘蓝类型。结球甘蓝进化枝的第一个分支由起源于中东地区的结球甘蓝材料所组成，支持了结球甘蓝的驯化开始于中东地区的假说。该假说也进一步被考古证据和历史资料所证实。该研究进一步提出了一项假说，即结球甘蓝和花椰菜起源于从西欧传入中东地区的高度分化的羽衣甘蓝， 很可能是通过青铜器时代（约公元前3300-1000年）的锡矿贸易路线进行传输，之后被再次引入到欧洲。物种树和分化时间推算表明古多样化的羽衣甘蓝家系衍生出了LHL和AIL两大家系（图2）。该研究收集了大量芸薹属C基因组种质资源材料，为甘蓝育种改良提供了宝贵的遗传资源。

来源：园艺研究

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http://agri.ckcest.cn/file1/M00/03/32/Csgk0YbjNxOAIP2tACdkoMjmGBM632.pdf

学术文献

1．Two wrongs make a right: heat stress reversion of a male-sterile Brassica napus line(雄性不育欧洲油菜系的热应激逆转)

简介：Male-sterile lines play important roles in plant breeding to obtain hybrid vigour. The male sterility Lembke (MSL) system is a thermosensitive genic male sterility system of Brassica napus and is one of the main systems used in European rapeseed breeding. Interestingly, the MSL system shows high similarity to the 9012AB breeding system from China, including the ability to revert to fertile in high temperature conditions. Here we demonstrate that the MSL system is regulated by the same restorer of fertility gene BnaC9-Tic40 as the 9012AB system, which is related to the translocon at the inner envelope membrane of chloroplasts 40 (TIC40) from Arabidopsis. The male sterility gene of the MSL system was also identified to encode a chloroplast-localized protein which we call BnChimera; this gene shows high sequence similarity to the sterility gene previously described for the 9012AB system. For the first time, a direct protein interaction between BnaC9-Tic40 and the BnChimera could be demonstrated. In addition, we identify the corresponding amino acids that mediate this interaction and suggest how BnaC9-Tic40 acts as the restorer of fertility. Using an RNA-seq approach, the effects of heat treatment on the male fertility restoration of the C545 MSL system line were investigated. These data demonstrate that many pollen developmental pathways are affected by higher temperatures. It is hypothesized that heat stress reverses the male sterility via a combination of slower production of cell wall precursors in plastids and a slower flower development, which ultimately results in fertile pollen. The potential breeding applications of these results are discussed regarding the use of the MSL system in producing thermotolerant fertile plants.

来源：Journal of Experimental Botany

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全文链接:

https://academic.oup.com/jxb/advance-article/doi/10.1093/jxb/erac082/6539845?login=true

科技图书

1．Mitigation of Plant Abiotic Stress by Microorganisms - Applicability and Future Directions(微生物对植物非生物胁迫的缓解作用 – 适用性和未来方向)

简介：The microbial ecosystem provides an indigenous system for improving plant growth, health and stress resilience. Plant microbiota, including isolated microbial communities, have been studied to further understand the functional capacities, ecological structure and dynamics of the plant-microbe interaction. Due to climatic changes, there is an urgent need to bring microbial innovations into practice. Mitigation of Plant Abiotic Stress by

Microorganisms: Applicability and Future Directions is a comprehensive review of the different strategies available to improve the plant microbiome. Chapters include key topics such as: harnessing endophytic microbial diversity, microbial genes for improving abiotic stress tolerance, and microbial bioformulations. Putting these strategies into practice can have varying success in the field, so it is crucial that scientists are equipped with the knowledge of which microorganisms are needed, as well as the use and suitability of delivery approaches and formulations. This title will be an essential read for researchers and students interested in plant microbial technologies and plant bio stimulants, plant pathology, biocontrol, agronomy, and environmental mediation.

来源：Elsevier

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2 . Agricultural Nanobiotechnology-Biogenic Nanoparticles, Nanofertilizers and Nanoscale Biocontrol Agents（生物纳米颗粒、纳米肥料和纳米生物防治剂）

简介：Agricultural Nanobiotechnology: Biogenic Nanoparticles, Nanofertilizers and Nanoscale Biocontrol Agents presents the most up-to-date advances in nanotechnology to improve the agriculture and food industry with novel nanotools for the controlling of rapid disease diagnostic and enhancement of the capacity of plants to absorb nutrients and resist environmental challenges. Highlighting the emerging nanofertilizers, nanopesticides and nanoherbicides that are being widely explored in order to overcome the limitations of conventional agricultural supplements, the book provides important insights to enable smart, knowledge-driven selection of nanoscale agricultural biomaterials, coupled with suitable delivery approaches and formulations will lead to promising agricultural innovation using nanotechnology. Agricultural Nanobiotechnology: Biogenic Nanoparticles, Nanofertilizers and Nanoscale Biocontrol Agents explores emerging innovations in nanobiotechnology for agriculture, food, and natural resources to address the challenges of food security, sustainability, susceptibility, human health, and healthy life. The book is ideal for the multidisciplinary scientists whose goal is to see the use of nanomaterials in agriculture to reduce the amount of spread chemicals, minimize nutrient losses in fertilization and to generate increased yield through pest and nutrient management.

来源：ELSEVIER

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全文链接:

http://agri.ckcest.cn/file1/M00/03/32/Csgk0YbjOTmAKOR2ABBNWvcJxSo686.pdf