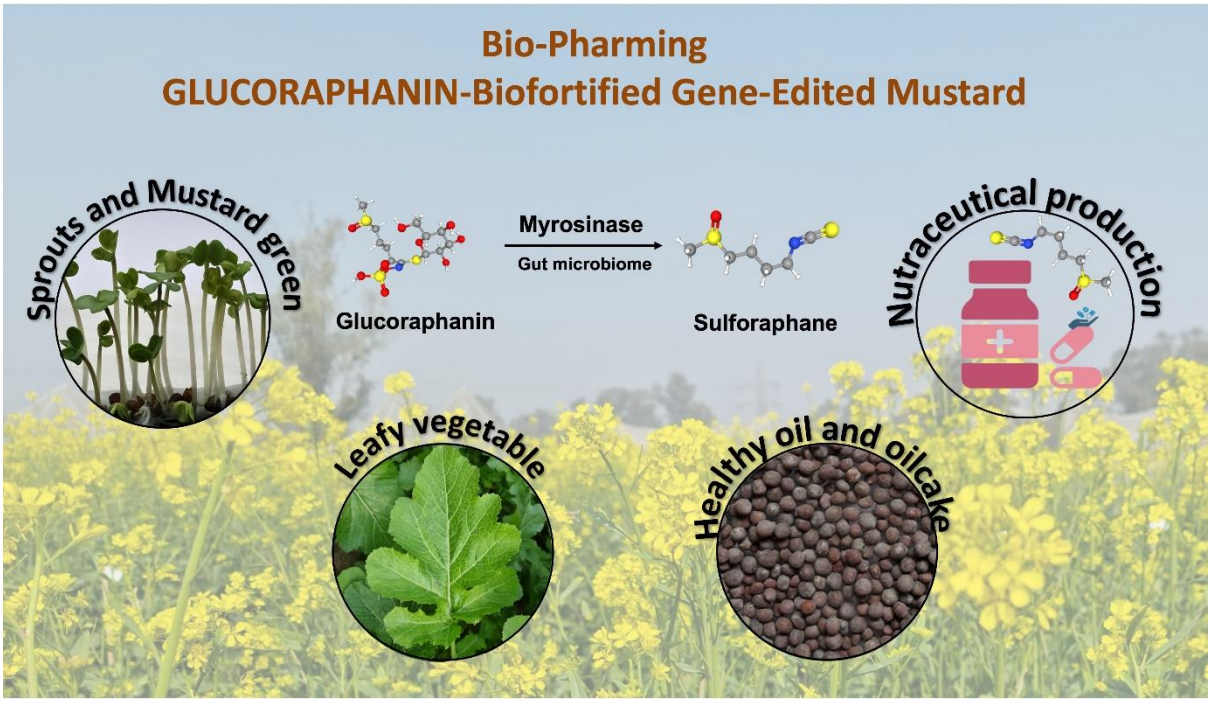
Indian mustard biofortified with cancer-preventive, GLUCORAPHANIN



Glucoraphanin, a well-studied glucosinolate found mainly in broccoli, is valued for its health benefits, especially through its breakdown product, sulforaphane, which has anti-cancer, anti-inflammatory, antioxidant, and other protective effects against diseases like arthritis, asthma, and neurodegenerative disorders. However, a high intake of broccoli is needed to get these benefits, and its cultivation faces genetic and environmental limitations.

To address this, BRIC-NIPGR researchers have developed **transgene-free Indian mustard** (*Brassica juncea*) lines using **CRISPR/Cas9**-mediated knockout of the *ALKENYL HYDROXALKYL PRODUCING 2* **(*AOP2*)** gene family, leading to **high glucoraphanin accumulation (up to 75 PPM in microgreens)**. These mustard lines also have reduced harmful glucosinolates and could serve as a **new generation of superfood,** with potential **anti-cancer and chemopreventive benefits**. Their various parts - sprouts, microgreens, leaves, oil and oilcake - could be used for human and animal diets and for producing **glucoraphanin-based supplements and medicines** on an industrial scale.

Kumar P, **Bisht NC*** (2025) High-level production of health-beneficial glucoraphanin by multiplex editing of *AOP2* gene family in mustard. *The Plant Biotechnology Journal*

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