

RAPD polymorphism in *Puccinia sorghi* Schw. causing common rust of maize

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Maize (*Zea mays* L.) is one of the most important cereal crops that expand its adaptation from very high north and south latitudes in temperate areas, through subtropical and tropical environments in north and south of the equator. As many as 18 foliar diseases are reported to occur in India, but common rust of maize caused by *Puccinia sorghi* Schw. is considered to be a major disease. Due to the high virulence of *Puccinia sorghi* Schw. in maize field populations, genetic variability of this fungus has been accounted as one of the chief causes of disruption in cultivar resistance. Virulence diversity of *Puccinia sorghi* Schw. in maize has been mainly attributed to parasexual recombination and mutation processes. Morphologically, it is difficult to distinguish between various isolates of *Puccinia sorghi* Schw. Research work with respect to the molecular variation of this pathogen in India is limited and needs further investigation.

An experiment was conducted at University of Agricultural Sciences, Dharwad, Karnataka to detect molecular variation in *Puccinia sorghi* Schw. through molecular tool viz., RAPD. In this study, molecular variation in the pathogen shall serve as a guideline for breeding suitable maize varieties against common rust disease which seriously affects maize productivity. Losses in total yield in late-planted sweet corn were 18 per cent, 26 per cent and 49 per cent for cv. Sugarloaf (most resistant), cv. Jubilee (intermediate) and cv. Style Pak (most susceptible), respectively. Out of 10 primers used, 3 primers viz., OPA-19 (11.11 %), OPB-17 (20 %) and OPF-2 (14 %) showed polymorphism. The similarity coefficient values revealed that, the least similarity (81 %) was between Tamil Nadu-Andhra Pradesh, Haryana-Tamil Nadu and Madhya Pradesh-Haveri isolates. The maximum similarity (100 %) was found between Andhra Pradesh-Haryana and Belgaum-Jammu & Kashmir isolates. Bihar isolate formed entirely separate cluster within group A; whereas Tamil Nadu-Maharashtra and Bijapur-Haveri isolates formed separate clusters within group A. In group B, Sikkim, Uttar Pradesh, West Bengal and Bengaluru isolates formed entirely separate clusters respectively.

Keywords: Genetic variability, Maize, *Zea mays*, Common rust, *Puccinia sorghi* Schw, RAPD.

Biography

Utpal Dey has received B.Sc. (Agri.) degree from Central Agricultural University, Imphal, Manipur and M.Sc. (Agri.) specialization in Plant Pathology degree from University of Agricultural Sciences, Dharwad, Karnataka. Now he is doing Ph.D. degree from Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra. He has received additional degree in Journalism and Mass Communication (PGDMCJ). He has published four research papers in reputed National and International Journals, 11 popular articles. He has participated in several National and State level conferences.

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Chitosan and its derivatives as promising materials for controlled drug delivery

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Chitosan, a natural based-polymer obtained by alkaline deacetylation of chitin, is nontoxic, biocompatible, and biodegradable. These properties make chitosan a good candidate for the development of conventional and novel drug delivery systems. Chitosan and its derivative nanoparticles are good drug carriers because of their good biocompatibility and biodegradability, and can be readily modified. As a new drug delivery system, they have attracted increasing attention for their wide applications in, for example, loading protein drugs, gene drugs, and anticancer chemical drugs, and via various routes of administration including oral, nasal, intravenous, and ocular. For a breakthrough in utilization, especially in the field of controlled drug delivery, graft copolymerization onto chitosan will be a key point, which will introduce desired properties and enlarge the field of the potential applications of chitosan by choosing various types of side chains. Chemical modification of chitosan is useful for the association of bioactive molecules to polymer and controlling the drug release profile. This paper reviews on chitosan and its derivative nanoparticles, including its preparation methods, characteristics, modification, in vivo metabolic processes, and applications. From the studies reviewed it is concluded that chitosan and its derivatives are promising materials for controlled drug delivery.

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