

IMMUNOLOGICAL MARKER to ASSESS the PATHOGENICITY LEVELS of T. INDICA FUNGAL ISOLATE

Wheat (*Triticum aestivum* L.) is one of the most important food grain crops of the world. It is staple food for nearly 40 per cent of the world population covering at least 43 countries and provides 20 per cent of food calories to mankind. Wheat is the second most important grain crop after rice in India. It is an important cereal crop of family Graminae. India grows *Triticum aestivum*, *Triticum durum*, and *Triticum dicoccum* wheats.

In India, the wheat is affected by a number of diseases out of which rusts, smuts, powdery mildew, loose smut, leaf blight and Karnal bunt continue to be the limiting factor in increasing wheat yield. Karnal bunt (*Tilletia indica*, Syn. *Neovosia indica*) is a fungal disease that affects wheat, durum wheat and triticale. The disease is sometimes called partial bunt because only part of the kernel usually is affected. Karnal bunt was first discovered in 1930 in Karnal, India (Mitra 1931). Since then it has occurred in Pakistan, Iraq, Nepal, Afghanistan, Mexico and the United States. The first U.S. occurrence was in Arizona in 1996 and in 1997 Karnal bunt appeared in Texas.

Karnal bunt seldom results significant yield losses to wheat in the field. However, it affects flour quality if more than 3% of the grains are bunted, because it gives off a fishy odor due to the presence of trimethylamine secreted by teliospores. As it can be seen that none of the control measures had been proven to be satisfactory for the disease management although many fungicides have been tested for effectiveness, results have not been satisfactory. Some plant breeder develops resistant line by germplasm of bread wheat from China, India, and Brazil but no line is fully resistant for Karnal Bunt. Among the living organisms fungi exhibit high diversity, between as well as within the species. These variations similarly reflect in their morphological, developmental as well as in pathogenic behavior. Due to high diversity in *T.indica* isolate, Plant Breeder required highly virulent isolate for screening during hybridization programme. Our invention helped to plant breeder for the selection of highly virulent isolate for making resistant line of wheat. Our invention is giving an in vitro, lab scale, reliable, environment independent inexpensive technique for plant breeder and plant pathologist, and this method will save the time and labors required for pathogenicity testing on host differentials under field conditions and the results of which are also variable due to dependency on environment.

Advantages:

1. This is simple, reliable and environmental factors independent *in-vitro* technique to detect the pathogenic levels of *T. indica* isolates.
2. This is highly effective method for detection of pathogenic levels of different *T. indica* isolates was developed by the comparison of immuno reactivity of fungal isolates under natural and induced conditions by host determinant(s).
3. This invention relates to the field of diagnostic plant pathology. More specifically the invention relates to the immunological detection of the pathogenicity levels of *T.indica* isolates known to be the etiologic agents of Karnal bunt disease in wheat.
4. The immunological tools can be useful for the study of teliospore dormancy, disease initiation and pathogenesis of KB.