

# Isozyme Variability in *Phaeoisariopsis personata* (Berk. and Curt.) von Arx Causing Late Leaf Spot of Groundnut (*Arachis hypogaea* L.)

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## SUMMARY

*Phaeoisariopsis personata* (Berk and Curt.) von Arx causing late leaf spot (LLS) of groundnut is one of the major constraints for its production in Karnataka. Isozyme studies conducted to know the molecular variability among the isolates. Fifteen commonly growing groundnut varieties infected by *Phaeoisariopsis personata* in the Main Agricultural Research Station (MARS), Dharwad and nine isolates obtained from different locations of North Karnataka were selected. Isozyme studies revealed the variations among the isolates since they produced an extra band with respect to various enzymes, Peroxidase (PO) and Polyphenoloxidase (PPO). Greater peroxidase and polyphenol oxidase activity with similar banding pattern were noticed in the isolates from V14, VIS, VI and V3, V4, V5, V8, V9 and VIS under Dharwad location. Among the nine isolates collected from different locations, revealed that the isolate HAN (Hanumanamatti) and ARA and NIP (from Arabhavi and Nippani) showed higher PO and PPO activity, which produced maximum of three bands with little variation in Rm values.

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## Key words :

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Isozymes are defined as multiple molecular forms of a single enzyme. These forms usually have similar if not identical, enzymatic properties, but slightly different amino acid compositions due to differences in the nucleotide sequence of the DNA that codes for the protein. Often the only difference among isozymes is the substitution of one to several amino acids. Isozyme banding patterns obtained from fungi are usually relatively uncomplicated and easy to interpret. Isozyme analysis can be readily performed in most laboratories with relatively little expense. Isozyme analysis has proven particularly useful in situations where it is necessary to differentiate among two (or) more morphologically similar fungi. An isozyme is a direct expression of genotypes and can be used as an indicator of genetic relationships with related population. Each type of enzyme often exists in several forms known as isozymes that carry out the same function but may vary from one another in several properties, requirements and mechanism of action. Several workers examined the possibility of separating fungal taxonomy based on enzyme analysis in gel electrophoresis (Hall, 1971 and Scalo *et al.*, 1981). However, the number of intensity of bands also depends upon the age and type of the organism (Racuson and Foote, 1966). Hence keeping this in view the present investigation on isozyme variability in *P.*

*personata* causing late leaf spot in groundnut was undertaken.

## MATERIALS AND METHODS

Groundnut leaf samples showing typical symptoms of late leaf spot caused by *P. personata* were collected from nine different locations (Arabhavi, Annigere, Bijapur, Indalgi, Hanumanamatti, Shirahatti, Nippani, Raichur and Dharwad) and also fifteen different varieties *viz.*, (DH-212, DH-86, DH-101, DH-40, DH3-30, GPBD-4, Dh-2001-I, JL-24, TGLPS-3, JSP-2, ICGV-91192, ICGV-86950, LSVT-I-2005-7, LSVT-I-2006-2, TAG-24) in Main Agricultural Research Station (MARS), Dharwad during *kharif* 2007-08. Two hundred fifty gram of infected leaf sample was collected from each location/variety. The sample was placed in polythene bag with appropriate labeling. They were preserved in deep freezer at -20°C and used for the further study.

The possible existence of qualitative variation among pathogenic isolates of *P. personata* was assessed by adopting the vertical Poly Acryl amide Gel Electrophoresis (PAGE). Peroxidase, polyphenol oxidase, and catalase isozyme studies were undertaken as described hereunder.

Isozyme was extracted for individual sample. The leaf tissue with typical late leaf spot symptoms was separated from the leaf tissue with the help of puncture. The material

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