

## Relevance of rust spore load over bajra field

V. P. MALI<sup>1</sup>, AHER S. K. \*<sup>2</sup>, SONAWANE V.V.<sup>3</sup> AND PANDE B.N.<sup>4</sup>

<sup>1</sup> Anandrao Dhonde Alias Babaji Arts, Commerce And Science College Kada, Tal. Ashti Dist Beed.414 202 (M.S.) India

<sup>2</sup> Department of Botany, New Arts, Commerce and Science College Parner, Dist. Ahmednagar. 414 302 (M.S.) India

<sup>3</sup> Department of Botany, Vasant Rao Naik Mahavidyalaya, Aurangabad. 431 004 (M.S.) India

<sup>4</sup> Department of Environmental Science, Dr. Babasaheb Ambedkar Marathwada Univ., Aurangabad – 431 004 (M.S.) India  
(Accepted : April, 2006)

### SUMMARY

The present paper deals with the airborne concentration of the urediniospore of *Puccinia penniseti* Zimm over a bajra fields in two kharif seasons. The experiments were conducted from 23<sup>rd</sup> June to 29<sup>th</sup> September 2000 in first Kharif season and from 19<sup>th</sup> June to 22<sup>nd</sup> September 2001 in second kharif season. The concentration of airborne urediniospores was assessed and the role of the meteorological parameters over the spore concentration were discussed. The relationship between the urediniospores concentration and the disease incidence in the field at various growth stages of the crop was studied. The spore concentration was maximum (13958/ m<sup>3</sup> of air) in the month of August 2000 in first kharif season whereas, it was maximum (16926/ m<sup>3</sup> of air) in the month of August 2001 in the second kharif season.

Key words : Rust disease, Bajra.

The rust disease of bajra caused by *Puccinia penniseti* Zimm. is prevalent in all the states of India where the crop is grown. Ramacher (1965) who described the taxonomy of *Puccinia penniseti* expressed that Zimmerman's *Puccinia penniseti* as a variety of *Puccinia substriata*. However, in the present survey the name of the pathogen *Puccinia penniseti* has been retained to avoid confusion. Ramakrishnan and Soumini (1948), Ramakrishnan and Sundaram (1956) studied the life cycle of the rust pathogen over bajra. They recorded that the uredinal and telial stages occurred on *Pennisetum typhoides* and pycnial and aecial stage on *Solanum melongena* and other species of *Solanum*. Dalela and Sinha (1962) reported the homothallism in *Puccinia penniseti*.

Airborne pathogenic spore load has been a neglected field except some references which however are critical. Important among them are of Mane (1978), who conducted the survey for general airspora components over bajra fields at Vaijapur. Aher and Pande (2004) made intensive study pathogenic fungal spores over the groundnut field. Ramachander Rao (1987), Meghraj (1989) and Garje (2000) made intensive and critical study of the pathogen and reported the concentration of urediniospores of *Puccinia penniseti* in the air in relation to disease incidence and growth stages of the crop.

The present survey was undertaken to elaborate and accumulate the information regarding the airborne concentration of the pathogen and its role in causing the disease and its ultimate disease incidence in relation with the meteorological factors.

### MATERIALS AND METHODS

Tilak continuous volumetric spore trap was employed for the present studies. The air sampler was installed and operated over the bajra fields for two kharif seasons at

Kada, Tal. Ashti, Dist. Beed (Maharashtra) from 23<sup>rd</sup> June to 29<sup>th</sup> September 2000 in the first kharif season and 19<sup>th</sup> June to 22<sup>nd</sup> September 2001 in the second kharif. Frequent visits to the fields were conducted for assessing the disease incidence in the field throughout the period of the investigation. The disease intensity and disease incidence were assessed at various growth stages of the crop.

### RESULTS AND DISCUSSION

#### *i) Observation on urediniopores concentration and meteorological parameters:*

The urediniospores of *Puccinia penniseti* are ovoid to elliptical, finely echinulate aquilaterally arranged, gerpores measuring 14 - 27  $\mu$ m x 18 - 36  $\mu$ m. The spore wall is yellowish brown to reddish brown.

While carrying out of the aerobiological investigations over the bajra fields the urediniospores were encountered in the atmosphere in both the kharif seasons of 2000 and 2001. However, the urediniospores concentration was high in the second kharif season 2001. The day to day variation in the urediniospore concentration for the first kharif season (23<sup>rd</sup> June to 29<sup>th</sup> September 2000) and second kharif season (19<sup>th</sup> June to 22<sup>nd</sup> September 2001) is expressed in Fig. I.

#### *a) First kharif season 2000:*

Though the air sampling was started on 23<sup>rd</sup> June 2000, urediniospore were trapped on 10<sup>th</sup> July ( 28/ m<sup>3</sup> of air ). The maximum spore concentration (13958/m<sup>3</sup> of air) was observed in the month of August when there was a record of 294.20 mm of rainfall 25.35<sup>o</sup>c of monthly average mean temperature and 69.05 % of monthly average humidity in that month. The highest spore catch was obtained on 27<sup>th</sup> August 2000 (1092/m<sup>3</sup> of air). The weather analysis on that day revealed 6.0 mm of rainfall, 25.75 <sup>o</sup>c of mean temperature and 75% of relative humidity (Table 1). There was also record of 18.4 mm of rainfall on the previous day. The spore

\*Author for correspondence