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ROLE OF NIGROSPORA ORYZAE (BERKS & BR) PETCH IN BLAST LESIONS OF RICE CAUSED BY PYRICULARIA ORYZAE CAV.

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THE blast lesions on rice leaves caused by *Pyricularia oryzae* showed predominant colonization of the fungus *Nigrospora oryzae* in Tamil Nadu. Both young and old blast lesions on the leaves of rice were affected. The blast-infected rice leaves collected from Tirur (Chingleput Dist.), Aduthurai (Thanjavoor Dist.) and Coimbatore revealed the presence of *Nigrospora* in all types of lesions. This was seen extensively on rice varieties IR 50, white ponni, etc.

The fungus *Nigrospora* is not known as a serious plant pathogen. It is mainly a saprophyte on old and dead parts of rice plant¹. It is not commonly seen associated with the lesions of other pathogens on rice leaves. *Helminthosporium oryzae* was found to induce two types of lesions—one a typical lesion and the other a small indistinct type. *H. oryzae* was found to exist with the fungus *Nigrospora* in the indistinct type of lesions on rice leaves². The blast lesions on leaves showed the association of *Nigrospora* clearly, with dark, minute dots which give a light dark appearance and one can easily recognize

the colonization of *Nigrospora* on the lesions. Studies with vertical spore traps with sticky cello-tape (5 cm²) for over 12 months at TNAU, Coimbatore revealed the presence of *Nigrospora oryzae* in the air. The spores showed an increase from March and the maximum were trapped in August and then there was a decline (table 1). The reduction in the number of *Nigrospora* spores trapped during December to March may be attributed to the fact that blast susceptible varieties of rice crop are discouraged during this season in Tamil Nadu.

Repeated culturing of the leaf tissues with the blast lesions on oatagar yielded mostly *Nigrospora oryzae* around the colonies of *Pyricularia oryzae* in the petri plates. The fungus *Nigrospora* was found to grow and develop at room temperature (26° to 30°C) and is a fast growing fungus. *Pyricularia oryzae*, which occurs during the period of cold weather is a slow growing and sensitive fungus and fails to develop in the presence of other fungi. *Nigrospora oryzae* was grown in the same culture plate in which *Pyricularia oryzae* was inoculated 5 days earlier and after 10 days it was found that *Nigrospora* had grown around *P. oryzae*, thus limiting the growth and development of *P. oryzae*. This was similar to 'aversion phenomena' in respect of *Nigrospora* and *Pyricularia oryzae*. The pathogen *P. oryzae* is concentrated in the centre of the lesions on the neck and nodes and the margin of the lesions is occupied by *Nigrospora*, *Cladosporium* and *Fusarium* sp^{3,4}. These three fungi were obtained from the blast lesions from the leaf of IR 50, and the *Nigrospora* was predominant. A few micro-organisms can invade lesions and displace pathogens⁴.

Table 1 Spore trap record at Tamil Nadu Agricultural University, Coimbatore

Month	Nigrospora spores trapped
February '86	74
March	144
April	418
May	472
June	640
July	1051
August	4580
September	1479
October	467
November	522
December	153
January '87	120

Nigrospora oryzae may have a preference to blast lesions for its colonization due to a specific nutrition available in the blast lesions of rice. The conditions under which the other less virulent fungi exist within the lesion are determined in part by the host and in part by the disease-inducing pathogen³. This may be the reason for the high spore load of *Nigrospora* in the air.

Nigrospora oryzae which is known to produce toxic metabolites⁵, may function as a natural antagonist to *Pyricularia oryzae* by limiting the blast lesion development. *Nigrospora* has been found to inhibit the development of the lesions induced by *H. oryzae*, and suppress the enlargement of lesions induced by virulent pathogens².

The nature of the nutrition available in the blast lesions that attracts colonization of *Nigrospora* needs further study. It may be stated that *Nigrospora oryzae* serves as nature's device to limit the spread of blast lesion in rice.

8 May 1987; Revised 5 October 1987

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EFFECT OF METHYL ISOCYANATE ON REPRODUCTION IN RATS

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METHYL ISOCYANATE (MIC) is a highly reactive chemical causing multiple damage to lungs, eyes and skin¹. Numerous reports have appeared following the Bhopal tragedy emphasizing that the major site of action of MIC is the respiratory tract².

Information on the effects of MIC on other organ systems is scarce, possibly due to the belief that it lacks extrapulmonary toxicity^{3,4}. MIC has, however, been found to be toxic administered by oral

and subcutaneous routes, possibly affecting organs other than the lung⁵. This is of relevance since MIC has been reported to cause damage to extrapulmonary organs like liver, kidney, gastrointestinal tract and heart muscle after a single exposure⁶. The present communication deals with the effects of a single dose of MIC on reproduction in rats.

Six to seven-month-old Albino Wistar rats of both sexes with proven fertility weighing 155–196 g were used. Fertility studies were carried out following essentially the methodology described in the literature⁷. Briefly, female rats showing six regular oestrus cycles prior to treatment with MIC, were selected for the study and the male rats were put for mating after 70 days following administration of MIC.

MIC (99% pure) diluted in olive oil was injected subcutaneously (s.c.) at a dose level of 2/3 LD₅₀ (LD₅₀ of MIC: male rats 328 mg/kg; female rats 261 mg/kg s.c.⁵). The s.c. route of administration has been preferred since the rate of absorption of an agent injected by this route is considered sufficiently constant and slow to provide a sustained effect⁸. The treated females were mated with untreated males and vice versa in the ratio of 3:1 and 1:1 respectively. The parameters investigated were the periodicity of oestrus cycle, receptivity, fertility and gestation period in female rats; virility and spermatogenesis in the male rats (adjudged by their mating behaviour and fecundity) and litter size, litter weight and neonatal survival during lactation of the pups. The gross effects on reproduction in F2 generation were also studied. The results are given in table 1.

Food intake and gain in body weight was normal in MIC-treated rats as compared to the control group. There was no adverse effect of MIC on reproduction as shown by various parameters studied. Pups born out of the mating of treated parents also exhibited normal reproductive behaviour on attaining puberty. Since the overall time of spermatogenesis extends to over 9 weeks in rats, the present study extending for 12 weeks after treatment with MIC would have revealed possible effects on any stage of spermatogenesis^{9,10}. However, there was no adverse effect.

As this report was being prepared, the effect of inhaled MIC (4 exposures) on fertility in mice appeared as proceedings of a symposium in which again the authors did not find any significant adverse effects in mating trials in mice¹¹.

The authors are grateful to Dr P. K. Ramachandran for encouragement.