

and will form the subject of a detailed communication elsewhere.

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NIOBOTARTARIC ACID

It is known that freshly precipitated niobic and tantalic acids dissolve in solutions of organic acids like oxalic, tartaric, etc., resulting in the formation of complexes. The oxalate-complexes have been investigated by Russ,¹ who also prepared a number of alkali nioboxalates. Edmister and Albritton² have furnished evidence for the formation of a complex of niobium with tartaric acid and also have reported a tartracolumbic acid; but its structure has not been confirmed and its salts have not been prepared. It was, therefore, proposed to study the complexes of niobium and tantalum with organic acids in greater detail.

Freshly precipitated niobic acid prepared from specially purified niobium pentoxide, was dissolved in hot aqueous tartaric acid. After filtering off undissolved niobic acid, the clear solution was concentrated and the niobotartaric acid crystallised with the addition of alcohol. The crystals were washed with dil. alcohol, dried and analysed. Niobium was determined by precipitating it from a solution of the sample and subsequent ignition and weighing as Nb₂O₅. Tartaric acid was estimated by the Goldenberg method.³ The crystals were also titrated with standard alkali using phenolphthalene as indicator. The results of the analysis bear out the meta composition, i.e., Nb₂O₅ : 2(C₄H₄O₆) for the niobotartaric acid formed. The sodium salt of this acid was also prepared by treating various sodiumniobates with tartaric acid. Further work on the complex acid and its structure is in progress by application of physical methods.

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A NOTE ON THE OCCURRENCE OF THE MITE-PARATETRANYCHUS INDICUS H. ON JOWAR (ANDROPOGON SORGHUM) AND ITS PREDATORS IN MYSORE

In the issue of *Current Science*, No. 7, July 1946, pp. 186-87, Haroon Khan, M., and Bhatia, S. C., have recorded the occurrence of the mite *Paratetranychus indicus* H., and its effective predator *Seymnus gracialis* M., on sugarcane at Sakrand (Sind) which they came across while making a survey of crop pests there. They have described the severity of the mite pest and how it was checked by the predator.

Ramakrishna Iyer, T. V., has mentioned in his *Handbook of Economic Entomology for South India*, *Paratetranychus indicus* H., as one of the minor pests of jola in some areas; and *Seymnus coccurora* R., as a predator on *Pulvinaria maxima* the Nim scale in Coimbatore. Lefroy has stated in *Indian Insect Life* that *Seymnus verampelinus* M., and *Seymnus nubilans* M., are commonly found feeding on cotton aphid and cotton mealy bug. In Mysore, the occurrence of the mite and its predators have now been noted for the first time.

During 1946 (July-September) it was seen that the leaf blades of Jowar in certain parts of Mysore, Mandya and Chitaddroog Districts had turned blood-red. This condition was known by different names: Chandramaru, Kunkumaroga, Rakthamari, Samberoga, Handiroga, etc., in different villages.

On examination of the leaf blades the presence of a large number of mites (*Paratetranychus indicus* H.) was made out on every blade that had turned red. It was evident that the reddening of the leaf was due to the work of the mites. All stages of the mites—eggs, nymphs and adults—were located generally on the ventral surface of the leaf blades (the presence of the mite was also made out on the dorsal surface of some). Counts taken from a number of infested leaves selected at random showed an average of 182 per square inch. This figure is sufficient to indicate that the incidence was quite severe. In patches of severe infestation the entire stalk of the plant had become dry and pithy and the development of grains was arrested; earheads too had become dry; some of the grains had also turned reddish.

Two kinds of predator beetles, *Seymnus* sp., were found actively feeding on the mites. One was a tiny black oval shaped beetle and was predominant in numbers. Both the larval grub and the adult were found to be feeding on this mite. The grub was found to actively chase the mite and when near dart at it to clutch it by its mandibles. It is transparent and full of warts and rows of short hairs on the tubercles. Pupae were seen on the leaf, attached by the caudal end. The adult beetle is uniformly black, the elytra being finely pubescent all over. The head region is tucked under, and cannot be made out and only the thoracic area is clearly seen.

The other beetle is bigger, brown in colour with a dark shade on the thorax and of the upper portion of the abdomen, the shade des-

ending narrowly in the centre of the elytra. The entire body is covered with fine pubescence. Both the grubs and the adults of these two Coccinellid beetles are effective predators on the mites.

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A NEW RACE OF PUCCINIA GRAMINIS TRITICI AND TWO BIOTYPES OF RACE 42

DURING the course of the work on testing the reactions of wheat varieties and hybrids to black stem rust caused by *Puccinia graminis tritici* carried out at Mahabaleshwar, it was observed that certain varieties of wheat which were highly or moderately resistant to seven races of black rust found in India, viz., 15, 21, 24, 34, 40, 42 and 75, in the seedling tests, developed large and healthy pustules when tested for mature plant resistance in the field. The presence of a new race or races in natural infection was suspected. Accordingly, isolations were made from some of these pustules, and the inoculum was multiplied separately on a susceptible variety of wheat grown in the glasshouse. The pathogenicity of the field isolates was tested on the wheats on which these were originally collected and ultimately pure cultures of three isolates were established.

These three isolates were tested on the differential wheat varieties and the reactions of the latter are described as under:—

(1) One of the isolates produced reactions on the differentials of an entirely different type from the reactions produced by any one of 189 races of black stem rust described by Stakman *et al.*¹ This isolate is, however, similar to race 119 of black rust except for its reactions on Khapli, which is highly resistant (1-type infection) to race 119 but is moderately susceptible (3 to 4-type infection) to the new race under the conditions of light and temperature obtainable in the cold season at Mahabaleshwar. The reactions produced on the standard differentials by the new race of black rust, the material of which is being submitted to Dr. E. C. Stakman for comparative tests with race 119 under controlled conditions, are given in Table I.

TABLE I
Infection types produced by the new race and race 119 of *P. graminis tritici* on differential wheat varieties

Physiologic race	Reactions of differential varieties											
	Little Club	Marquis	Reliance	Kota	Arnautka	Minium	Speinar	Kubanka	Acme	Einkorn	Vernal	Khapli
New race	4	×	0	0	4	4	4	4	4	3-4	3-4	3-4
† Race 119	4	×	0	0	4	4	4	4	4	1-3	3+	3+

† Infection types as reported by Stakman *et al.*

(2) The other two isolates, when tested on the differentials, proved to be race 42 of black rust, but were found, on further tests on other wheat varieties, to be biotypes of this race. One of the biotypes, viz., race 42A, produced type 4 infection on Khapli, whilst, under similar conditions of light and temperature at Mahabaleshwar, race 42, the material of which was originally obtained from the Rust Research Laboratory at Simla, produced type 3 infection. This biotype is more virulent on Khapli than race 42 or its other biotype, viz., race 42B, and can easily be distinguished from the two latter when Khapli plants infected with these are placed side by side. Biotype 42B is, however, similar to race 42 in its reactions on Khapli but can easily be distinguished from the latter by its reactions on other wheats. Both the biotypes of race 42 were found in natural infection at Mahabaleshwar during 1944-45 and 1945-46 seasons. Comparative reactions of race 42 and its two biotypes on some wheat varieties are given in Table II.

TABLE II
Comparative reactions of some wheat varieties to race 42 and its biotypes

Wheat variety	Race 42	Biotype 42 A	Biotype 42 B
Khapli C. I. 4013 (Standard differential)	3	4	3
* Ex 3	2-3	3	4
* C. 6014	0;-2	2	3
* C. 14098	0;	2	4
* E. 220	0;	2	3+
** Hofed 1	0;	2	3+

* Wheat varieties received from the Wheat Specialist, C.P. and Berar.

** Wheat variety received from the Cereal Breeding Station, N. Phad, Bombay Province.

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