

The results show that with regard to the HCN content none of the barks of the locally growing species of *Prunus* comes up to the standards laid down for the official drug. Attempts are, however, being made to cultivate *Prunus serotina*, on an experimental basis, as the requisite climatic conditions are available.

We are grateful to Col. Sir Ram Nath Chopra for his valuable guidance in the course of this investigation.

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AUTOTETRAPLOIDY AND ATTENUATING POWER IN YEASTS

INDUCTION of polyploidy has been claimed to be an important method for the improvement of crop plants. Duplication of the chromosome complement is followed in some cases by characteristic changes in the biochemical behaviour. Rowson^{1,2} has shown that autotetraploids have a higher alkaloid content than the diploids. Randolph and Hand^{3,4} give quantitative data on the carotenoid content and vitamin A activity of diploid and autotetraploid corns.

Little work on similar lines has, however, been reported in the case of yeast and fungi for the simple reason that the chromosome constitution of most of the strains are unknown. Conflicting reports have been published recently on induction of polyploidy in *P. notatum*^{5,6} as well as its relation to penicillin production.

In this laboratory two strains of beer yeasts of known chromosomal constitution are available. The tetraploid strain, BY 3, was obtained by treating the original diploid, BY 1, with acenaphthene.^{7,8} This tetraploid has been constantly under observation for the past two years. The vitaminic requirements of the diploid and tetraploid strains were shown to be similar,⁹ but their rates of growth are different.¹⁰ It was thought, therefore, that a comparative study of the attenuating power of the two strains would be interesting. An extensive series of experiments with varying sugar concentrations (16 per cent. to 40 per cent.) and yeast inocula have been carried out. A representative set of results is presented below.

The inocula for the fermentation trials were built up by growing the strains in wort with vigorous aeration. In each case a 24 hour culture in wort was centrifuged, washed and re-suspended in saline under sterile conditions to be used as the "pitch". Equal amounts of the two strains on the moist weight basis were then inoculated in sugar solutions contained in 100 ml. flasks. 25 ml. of the fermenting mixture after inoculation contained sucrose 6 gms., KH_2PO_4 0.4 gm., $(\text{NH}_4)_2\text{SO}_4$ 0.4 gm., and yeast 1.2 gm. (moist weight).

In each case the rate of attenuation was determined by noting the specific gravity of the fermenting mixture at intervals by means of a Westphal specific gravity balance. Alcohol percentages were calculated from the attenua-

tion data and the results have been graphically represented in Fig. 1.

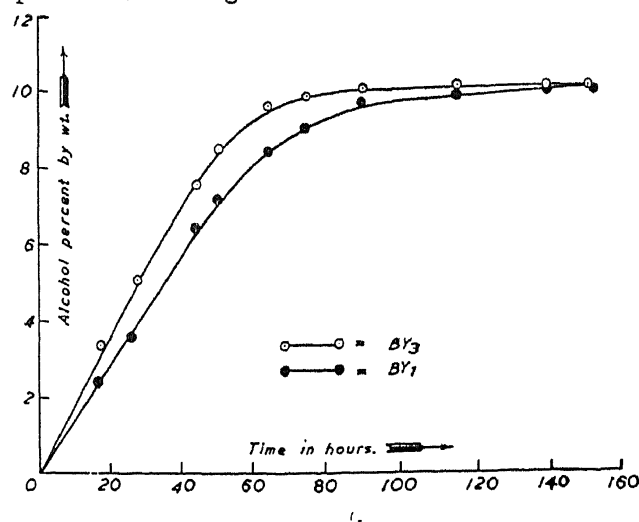


Fig. 1.

FIG. 1

It will be seen from the figure that the rate of attenuation is much faster in the case of the tetraploid strain. A careful study of the graph reveals that at any stage of fermentation the rate of alcohol production is approximately 30 per cent. faster than that by the diploid. The quickening in the rate of attenuation does not, however, reflect itself in the final yields of alcohol. The final concentration of alcohol in the media is the same in both cases although the limit is reached much earlier in the case of the tetraploid.

It appears that duplication of the chromosome complement in yeasts leads to an increase in vigour in that not only is there an acceleration of the rate of growth but also a quickening of the rate of attenuation.

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'RAYUNGAN' METHOD FOR SPEEDY MULTIPLICATION OF SEED MATERIAL IN SUGARCANE

EXPERIMENTAL stations are often faced with the difficulty of shortage of seed material of the new varieties which they receive from outside

or those that evolve themselves out of their selections. It often takes three to four years before one could get enough seed material for including the seedling in a properly randomised field-scale experiment. To expedite the multiplication of the seed material, 'Rayungan' method as described by Dillewijn¹ has been tried with slight modifications at Shahjahanpur. The method offers a much better scope for raising larger quantities of seed material than is possible by the ordinary method of multiplication, and consists of germinating the buds on the standing cane prior to planting in the field. To induce shooting in the buds the cane is topped, four to six weeks before the time of planting, with a sharp field knife of *hansia* (scythe). The topping cut is made in a slant in one stroke at a point as far as the millable cane is formed. The cane is then stripped off the leaves. The crop after topping is given a light dressing of ammonium sulphate, say, at the rate of 20 lb. nitrogen per acre and irrigated once or twice only. As soon as the buds grow into sufficiently developed shoots, called 'rayungans', 4 to 6 inches long, the cane is cut into one-budded setts which are planted in trenches previously prepared and manured. In handling the 'rayungans' much care is necessary to avoid damage, mainly due to their breaking at the base near the attachment with the sett. The leaves of the 'rayungans' are partly clipped off before planting in the soil to reduce transpiration. An irrigation is given immediately after planting. Frequent but light irrigations are subsequently given till the seedlings take root, and later, as with the normal plantings.

This method ensures germination and gives a greater amount of success as compared with the normal method of planting setts in the soil, in which, in spite of a rigorous selection of buds and provision of optimum conditions for planting, the germination (under Shahjahanpur conditions) seldom exceeds 30 to 50 per cent.²

The results of a field trial comparing the two methods are given below. The cane in this case was topped in the first week of April and planted in the first week of May 1947. The variety used was CoS. 186.

TABLE I

Method	No. of buds Planted	No. of shoots established	No. of millable canes on 30-9-47
New	80	69	221
Normal (Old)	80	33	115

The difference between the two methods as given above is very significant inasmuch as the germination and the subsequent amount of seed material (as judged by the number of millable canes) available are almost twice that secured with the normal method of planting.

It was also observed that the canes with the new method of planting were taller, thicker and healthier in look, due to the earlier establishment of shoots than is secured from the nor-

mally planted canes. This method has also the possibility of being adopted for late plantings in which normally a good stand is seldom achieved.

Further experimentation in this connection is in progress.

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OCCURRENCE OF *MYROTHECIUM RORIDUM* TODE EX FRIES ON COWPEA IN INDIA

In September 1945 and 1946, a leaf-spot disease was noticed on cowpea, *Vigna unguiculata* (Linn.) Walp. in Krishnanagar, Bengal. The fungus associated with the disease was identified as *Myrothecium roridum* Tode ex Fries. The genus *Myrothecium* has not been recorded in India.

Symptoms—The leaf-spots begin as minute, brownish dots, 1-2 mm. in diameter, having a raised margin, slightly pinkish violet in colour and a depressed centre, which is brown, thin and translucent. When the fungus invades the surrounding tissue a second zone is formed around the original spot. In the second zone also the thin and translucent brownish area is surrounded by the raised margin of a pinkish colour. Sometimes two or three such thin central areas have a common coalescing outer zone. The diameter of the inner and outer areas vary widely from a few millimetres to 2.5 cm. or more.

Morphology of the fungus—The sporodochia are produced on the dorsal surface of the laminae in the thinner zones of the spots. At first small islands of white, woolly, pseudoparenchymatous stromata, about 1 mm. in diameter arise. These stromata are composed of the intertwining conidiophores. The spores are produced from a closely packed hymenium-like layer of phialides. The spores remain aggregated together forming a jet black, viscid mass. Several of these sporodochia are produced in a circle in the spots and the spore masses merge with one another forming a more or less continuous irregular black circle.

The conidia are cylindrical or slightly tapering with rounded ends, continuous, 2 guttulate, hyaline at first, becoming pale green with a prominent black wall, measuring $10\mu \times 3\mu$ on the average.

Preston¹ studied the genus, *Myrothecium* and its three classic species, *M. inundatum* Tode ex Fr., *M. roridum* Tode ex Fr., *M. verrucaria* (Alb. and Schwein) Ditmar ex Fr., and has published emended descriptions of the same.

The fungus has been reported from England on *Viola tricolor*, *Antirrhinum majus*, *Lycopersicum esculentum*; from Sierra Leone, West Africa, on *Hibiscus esculentes*, *Dolichos lablab*,