mosaic consisting of polysaccharides and proteins. The polysaccharide and protein components are probably connected by lipids. The fact that periodic oxidation brings about an almost complete disappearance of hæmagglutination indicated that hæmagglutinin has a carbohydrate prosthetic group.

The examination of the structure of the virus surface may also throw light on the antigenic structure of the influenza virus and the chemical nature of its antigenic determinants. Since the surface of the influenza virus is chemically heterogenic, in other words, consists of proteins, polysaccharides and possibly lipids, the influenza virus may probably contain three groups of antigenic determinants—a polysaccharide, a protein and a lipid, resembling in this respect cocci salmonellae and other micro-organisms.

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A Virus Disease of *Crotalaria* spp. Transmissible to Abacá

In the course of investigations here of abaca mosaic virus, a mosaic disease of *Crotalaria* was successfully transmitted to abacá (*Musa textilis* Nee).

Several species of *Crotalaria* were used extensively in the past to provide temporary shade for young abaca plants in the field. *Crotalaria* mosaic is prevalent wherever *Crotalaria* is grown in the province of Davao, Philippines. The infection may range from 80 to 100 per cent in a mature stand of *Crotalaria*. Leaflets of infected plants are usually severely mottled and are sometimes reduced in size. Severe infections cause the leaf margins to be wrinkled and the leaflets curl downwards.

The virus can be transmitted from *Crotalaria* to abaca by the aphids *Rhopalosiphum maidis* (Fitch) and *Aphis gossypii* Glever. The symptoms caused by *Crotalaria* virus in abaca are distinct from those caused by abaca mosaic virus. In young abaca seedlings, the first leaf to develop symptoms of infection is almost completely chlorotic as though it had been etiolated. Only a small portion at the base and rarely at the tip appears greenish. In the succeeding leaves, the yellowing becomes less intense, the area affected is reduced. The yellowing may range from a few to numerous patches, and assumes no regular pattern. In many plants the yellow portions can resemble the damage caused by thrips or mites.

The over-all effect of the disease on abaca is not so severe as infection with abacá mosaic virus and infected plants are not markedly stunted.

The virus has also been transmitted to *Canna indica*, *Maranta arundinacea*, *Commelina* sp. and *Nicotiana tabacum* in the laboratory. The most striking feature of the *Crotalaria* virus infection is the absence of regularly shaped streaks on abacá leaves so typical of abacá mosaic virus infection. The abacá mosaic virus produces spindle-shaped streaks on the leaves, petioles and even on the pseudostem of infected abacá. In addition, the abacá mosaic virus does not infect tobacco or *Crotalaria*, both of which are susceptible to the virus from *Crotalaria*.

It is feared that the virus from *Crotalaria*, if given the chance to spread, may become a serious disease of abacá. However, no natural infection has so far been recorded on abacá in the field.

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GENETICS

Some Cytogenetic Properties of Autotetraploid Varieties of Sugar-Beet

Artificially induced autotetraploid sugar-beet (*Beta vulgaris* L.) is widely used for the commercial production of triploid sugar-beet. The triploid hybrids of sugar-beets were found to exceed the tetraploid varieties in many respects[1], such as yield, sugar content and greater uniformity in morphological structure.

An attempt was made to evaluate two autotetraploid varieties of sugar-beet on account of their somatic chromosome numbers. The exact number of chromosomes in tetraploid sugar-beet seems difficult to determine for the size of the chromosomes and the difficulties to spread them well enough for counting. When introducing some modifications of the orcein–acetic acid method described by Tjio and Levan[2], the chromosomes were found to stain deeply and to separate easily, making chromosome counts possible on a larger scale.

The procedure used was as follows: very small leaves of sugar-beet were collected from plants growing in individual pots or in the field at any time of their vegetative growth. To shorten the chromosomes the leaves were put either into a 0·002 mol/l. solution of oxiquinoline and kept at room temperature or placed in water and the tubes chilled in ice-water in a refrigerator for 3–4 h. After this pretreatment the material was fixed in Farmer's solution, containing 3 parts of absolute alcohol: 1 part of glacial acetic acid, and left in the fixative for at least 24 h. For maceration and staining, the leaves were transferred to tubes filled with a solution of 10 parts of 2 per cent orcein in 45 per cent acetic acid : 1 part of N hydrochloric acid. The tubes were left at room temperature for 24–28 h. Squash preparations were made, cutting a very small part of a leaf and mounting it in 45 per cent acetic acid. The coverslip was tapped with a rubber pencil, and, finally, moderate pressure was applied.

Four hundred plants of two different varieties of sugar-beet were analysed (Table 1).

Table 1

Variety		2n = 32	33	34	35	36	37	38	Total No. of plants
Busczynki tetraploid	No. of plants	1		6	26	115	40	12	200
	In %	0·5		3·0	13·0	57·5	20·0	6·0	
Ebro tetraploid	No. of plants		2	3	45	109	38	3	200
	In %		1·0	1·5	22·5	54·5	19·0	1·5	

The results indicate that the number of aneuploids in artificially induced autotetraploid varieties of sugar-beet is rather high. As aneuploids in general are known to be inferior to euploids these findings offer some explanation for the unequal performance of tetraploid beet. Furthermore, the occurrence of aneuploids in tetraploid varieties used for the production of triploids will reflect in the formation of aneuploid triploid plants, because, as Mochizuki[3] demonstrated, in sugar-beet male and female aneuploid gametes with $n = 18 \pm 1$ or 2 chromosomes are as functional as euploid gametes with $n = 18$. But while in tetraploids both parents furnish euploid and aneuploid gametes, the diploid parent of the triploid hybrid will