

CHROMOSOME NUMBER AND EFFECT OF COLCHICINE ON CHROMOSOMES OF COLCHICUM
LUTEUM, BAKER

Author(s): P. N. Mehra and T. N. Khoshoo

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were one or two stylar branches with stigmatic hairs (Fig. 4). In this case a membranous structure slightly swollen and resembling an ovary was noticed in the bottom portion.

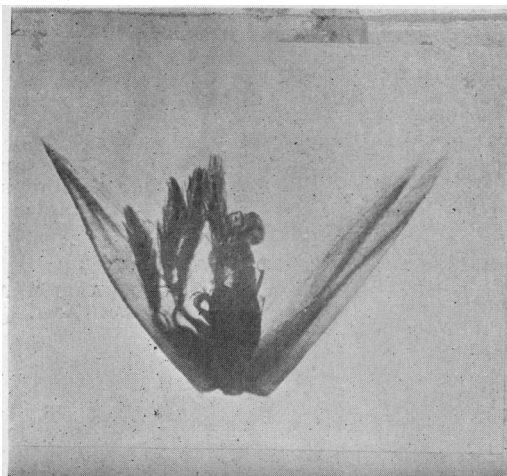


FIG. 1. Shows a spikelet with the glumes opened out and the essential organs *in situ*.

In the lower portion of the arrow, the anthers were normal in size but invariably had feathery stigmatic branches on top (Fig. 5). In others though the dehiscence was normal, the little pollen which was available was unhealthy and did not germinate *in vitro* or *in vivo*. In the middle portion of the arrow all the different degrees of transformation were met with in the same spikelet. This is illustrated in Fig. 2, while Fig. 1 shows the essential organs of the spikelet with the glumes opened out.

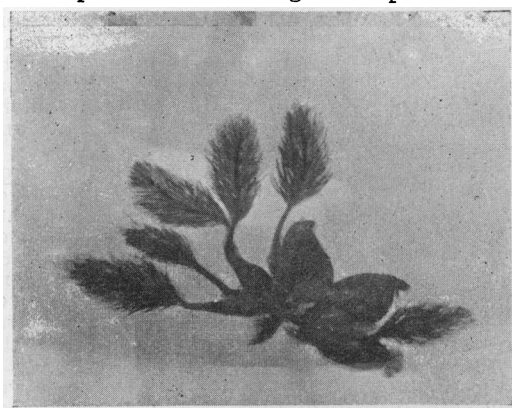


FIG. 2. Shows the different degrees of transformation of the anthers in the same spikelet.

When the arrow was selfed, there was no seed setting indicating that the little pollen available was not capable of fertilising the ovule. Normal seed setting was observed when foreign pollen was used, but it was always the normal carpel which produced the seed.

The above pistillody in G. 5023 was noticed during all the three flowering seasons from

1945-47. This would appear to be due to inherent genic factors and not to influence of environmental conditions.

Another interesting feature noticed in G. 5023 was that like its pistil parent, *S. spontaneum*, L. (Uganda), it is also protogynous. Even the few anthers that dehisce open only two days after the coming out of the stigmas. This coupled with the phenomenon of pistillody enables the variety being used as an ovule parent.

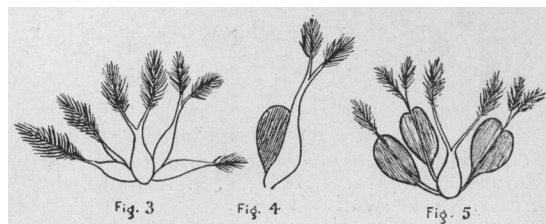


FIG. 3. Shows all the three stamens transformed into carpels. FIG. 4. Shows half the anther transformed. FIG. 5. Shows three normal anthers but with stigmatic branches on top.

A seedling of *S. spontaneum*, L. (Uganda) and *Sorghum rigidifolium* also showed such abnormalities though not to such an extent. Herein the anthers have been partially transformed, there being one or two stylar branches on top of the generally shrivelled anthers which are a pulpy mass containing no pollen grains.

Sugarcane Breed. Station, N. L. DUTT.
Coimbatore,
June 29, 1948. J. THULJARAM RAO.

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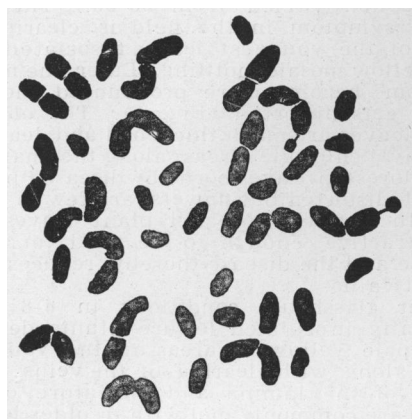
CHROMOSOME NUMBER AND EFFECT OF COLCHICINE ON CHROMOSOMES OF *COLCHICUM LUTEUM*, BAKER

Colchicum luteum, Baker is a Liliaceous plant growing in Afghanistan, Turkistan and Western Himalayas—extending from Murree Hills to Chamba and Kashmir at an altitude of 4,000 feet to 7,000 feet on grasslands. It is an Indian substitute for the European *Colchicum autumnale* as the source of drug Colchicine.

The material was collected from Murree Hills. The corms were grown in December 1946 in pots containing sand which was irrigated regularly with Knops solution. The pots were kept in green-house. Corms produced roots abundantly in about two weeks time.

The root tips fixed were in Craf's fixative. Observations were made from paraffin sections 10 to 12 μ thick which were stained with Crystal Violet-Iodine.

The chromosome number is 38 (Fig.). The chromosomes usually occur in small groups.



Somatic metaphase from a root tip cell showing $2n=38$
 $\times 3,000$

Thus it was difficult to count the chromosome number easily. There were obtained, however, some good plates in which the chromosomes could be easily counted.

Some of the chromosomes are dot-shaped and some are comparatively longer. The position of the kinetochore in the long chromosomes appears to be median or nearly so. Two of the chromosomes in the karyotype possess a satellite each with a fine stalk.

The chromosome numbers of other 10 species of the genus as observed by Levan (1940b) form an aneuploid series of 35, 38, 40, 42, 44 and 54. This diversity in the chromosome number coupled with the fact that even in the same species the number varies (Levan, 1940b) is interesting. Until detailed studies of mitosis and more particularly meiosis are carried out, it is difficult to throw any light on the basic chromosome number and the nature of polyploidy in the genus.

Incidentally the effect of Colchicine was tried on the root mitoses. The corms with good number of roots were placed in the Colchicine solutions ranging from .4%–2% for one day to 62 days. During all this time there was no sign of the macroscopic c-tumours so characteristic of the roots treated with Colchicine. The root growth was not at all accelerated or impaired in any way. It was perfectly normal. Longitudinal sections of the treated material fixed at regular intervals, showed that mitoses occur quite normally even when roots were placed in an overdose (2%) of Colchicine for over two months. This observation is in close accord with those of Blakeslee (1939) and Levan (1940a) on *Colchicum autumnale*.

This clearly shows that besides *Colchicum autumnale* the spindle of *Colchicum luteum* is also not at all susceptible to Colchicine. Experiments may show that this may be true for all the species of the genus. The genus *Colchicum* seems to have developed this

immunity towards Colchicine owing to its faculty of producing the drug in its tissues.

Botany Department, P. N. MEHRA.
E. P. University, Amritsar. T. N. KHOSHOO.
July 18, 1948.

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XANTHOMONAS MALVACEARUM (ERW. F. SMITH) DOWSON ON EXOTIC COTTONS IN INDIA

SEVERAL workers in India have mentioned from time to time the occurrence of bacterial leaf-spot of cotton, although none has so far isolated the pathogen in a pure state. In fact, confusion has existed between this disease, *Alternaria* leaf-spot and anthracnose of cotton.

This disease, also known as angular leaf-spot or black-arm, is quite common on exotic cottons grown at Broach, Dharwar, Gadag, Jalgaon, Surat and Viramgam. Outside this Province, it has been reported from Bellary, Coimbatore and Salem in the Madras Province, Parbhani in Hyderabad State and in the Punjab. The pathogen has now been isolated in pure state for the first time from diseased leaves of exotic cottons received from several places in Bombay Province.

The disease closely resembles the one described by E. F. Smith (1901),¹ which is characterised by minute water-soaked spots measuring 1 to 2 mm. on the lower side of young leaves. These spots look translucent when held against light. During monsoon, the disease can be reproduced in the glasshouses at Poona, 4 days after inoculation. In addition to the lamina of the leaf, the mid-vein, lateral veins and the edges are also infected. The water-soaked spots become brown with purplish margins and ultimately turn black. Gummy bacterial exudations are often found in the form of a crust or scales on the under-surface of the leaves. In severe cases of infection, when several lesions coalesce and veins are attacked, the leaf looks typically wrinkled. Such leaves turn yellow and fall to the ground.

On punctured stems and petioles, the pathogen produces elongated, grayish to sooty black areas after an incubation period of 7 days. Heavily attacked stems show deep cracking and gummosis and can easily be broken by wind, while the infected petioles droop. This stage of the disease is known as 'black-arm'.

Infection of bracts is more visible in the case of 'Sakel' cotton (*G. barbadense*). Young succulent bolls, 13 days after inoculation, show round, raised spots, which become irregular in shape, brown in colour and depressed in the centre. Bacterial ooze in the form of small shining beads is found in the centre of depressed spots, which later turn deep black. Badly affected bolls remain small and shrunk and