surrounding cells. Thus internal vascular strands carrying on their independent growth are differentiated. With the continued growth of the axis and without the cessation of the activity of the normal cambium more and more strips of secondary cambium appear in the rest of the xylem formed from the primary and secondary cambiums. The continued growth of the wood parenchyma ultimately splits the vascular cylinder into numerous irregular strands in a manner similar to that found in many lianes, *e.g.*, *Bauhinia*, etc. This type of structure is generally considered to be correlated with the habit of lianes, but here it is found in just a reverse type of plant—a species with a very stunted stem.

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## A Note on the Occurrence of a Smut on Two Indian *Selaginellas.*

THE occurrence of a fungous disease on the Peteridophytes is a comparatively rare phenomenon. In October, 1932, we collected two species of *Selaginella*, *S. chrysocaulos* Spr. and *S. chrysorrhizos* Spr., from Rajpur and Mussoorie respectively. On an examination of the material we found the presence of dark brown irregular patches on the leaves and stems of both the species. The fungus was at once identified as one of the Ustilaginales, but there was some difficulty in the generic determination. On referring to the previous literature on the subject we found that Mr. T. C. N. Singh[1] had already reported the occurrence of a species of *Entyloma* (?) on *S. chrysocaulos*, the material of which had been collected by Dr. B. Sahni while on his way back from Mussoorie to the Plains. From an examination of some of this material, kindly sent to us by Prof. Sahni, we think that the two forms are identical. The identification of the genus is still a matter of some doubt and will probably remain so till the spores have been germinated, but judging from the sorus and spore morphology it bears greater resemblance to *Melanotœnium* than to *Entyloma*. One of the differences mentioned between the two genera is the presence of highly coloured to brownish spores in *Entyloma*, while those of *Melanotœnium* are of a distinctly darker shade.[2] As reported by Singh, hyphæ are not of frequent occurrence, but in our material (some of which had younger sori) we often came across the more or less finger-like haustoria present in the cells of the host.

In conclusion, we wish to offer our sincere thanks to Dr. E. J. Butler, of the Imperial Mycological Institute, Kew, for having given us the benefit of his advice with regard to the identification of the fungus.

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[1] Singh, T. C. N., "A note on the occurrence of a smut on *Selaginella chrysocaulos*," *New Phytol.*, 1930, **29**, 294-296.

## A Virescent-White Mutation in Rice.

IN the early strain of Kolamba, K 79, a seedling with white leaves was discovered last season. As the seedling displayed unique appearance it was potted off and reared carefully. Periodic examination of the growth of the seedling showed that the new leaves were invariably devoid of chlorophyll presenting whitish appearance, but very gradually changing to greenish colour, the colour developing from tip downward. The seedling was normal in fertility.

During the current season about 400 seedlings of the white mutant were raised and all of them were like the original plant. In due course a number of seedlings of the mutant and the normal parent strain were transplanted in the field for agronomic comparison. The results are as below:

| Character | Mean No. of days to flower from sowing | Mean height of plants cm. |
|---|---|---|
| K 79 .. | 90·96±0·30 | 118·58±1·28 |
| Mutant .. | 95·66±0·62 | 82·25±2·90 |

| Character | Mean Panicle length cm. | No. of tillers | Mean yield per plant gm. |
|---|---|---|---|
| K 79 .. | 28·75±0·32 | 5·83±0·18 | 19·04±0·76 |
| Mutant .. | 19·46±0·78 | 2·50±0·25 | 2·51±0·34 |

[2] Clements and Shear, *The Genera of Fungi*, New York, 1931.

It will be seen that the virescent-white plants are inferior to K 79 in panicle length, height, number of tillers and in yield, although they are late by about five days. The differences in all cases are highly significant. The slow growth of the virescent-white plants is due to very slow rate of chlorophyll formation. Colourmetric readings show that the mutant plants have about 66 per cent. chlorophyll compared to K 79.

The writer is not aware of any previous report of this type of chlorophyll mutation in rice, although albino, yellow and striped chlorophyll mutations have been reported.

The new type has been crossed with the parent K 79 to determine the mode of inheritance.

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## On the Increase of Mutation Frequency following Inter-Specific Hybridization in *Nicotiana*.

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THE hybrids produced between *Nicotiana Sanderæ* ($n=9$) with certain other far related *Nicotiana* species often formed some white stripes in the flowers. Every year for the last eight years I raised *N. Sanderæ* with various flower colours (whitish, pink, red, and the like, of the various intensities of red-violet colours), and have seen this species growing in many gardens, but only three times have I seen the kind of stripings as those observed in some of its $F_1$ hybrids.

The red flowering *N. Tabacus* var. *sanguineæ* ($n=24$) behaves in some crosses like *N. Sanderæ*. It has blood-red flowers.

In the crosses of the red flowering *N. Sanderæ* and *N. Tabacum* with the white flowering species [*N. alata* ($n=9$), *N. sylvestris* ($n=12$), *N. suaveolens* ($n=16$), *N. noctiflora* ($n=12$), *N. Tabacum alba* ($n=24$), etc.] and with greenish-yellowish flowering ones [*N. rustica* ($n=24$), *N. paniculata* ($n=12$), *N. Langsdorffii* ($n=9$), *N. glauca* ($n=12$)], red behaves like a dominant, in some combinations, however, incomplete dominance occurs too.

The stripings that appear on the $F_1$ hybrids usually affect single flowers. They appear with one or more than one white stripe on the red or pink background, or with pink stripes on a red background. The size of the affected areas vary very greatly. The largest white area I found was about 1 sq. cm. covering about 1/6 of the whole corolla (five petals), while the smallest ones represent only a small group of several cells. Sometimes we found red spats or stripes (reverse mutations) in the region of the white ones. Some flowers have only one stripe, while others have more than sixty (Fig. 1). The more detailed observations made on several hybrids are summarised in Table I. Other hybrids are not studied in detail.

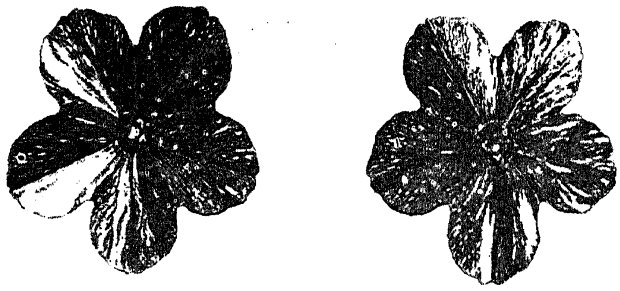

**Fig. 1.**

Striped flowers from a hybrid *N. noctiflora* × *N. Sanderae.*

It should be mentioned here that *N. Sanderæ* plants are often heterozygous and some of the $F_1$ hybrids, where *Sanderæ* participates, differ to a certain extent. Different genotypes of *N. Sanderæ* do not show the same degree of variegations. The most striking results were produced in some of the crosses between *N. noctiflora* (from the Harvard University, syn. *N. Cavanilesii*) and red flowering *N. Sanderæ*. Drawings of two extreme types are given in Fig. 1. We have the impression that the older hybrids have many more striped flowers, and the affected areas are much greater in the older hybrids than in the younger ones.

The stripings of the hybrid *N. Tabacum* var. *sanguineæ* × *N. alata* (white flowering) usually represent pink stripes on the red (reddish) background. But it was found