tubers has been correlated with the cyanoglucoside content of tubers, but Pereira and Gomas[4] pointed out that this may not always be true. Recently Sinha, *et al.*[5] studied the possibility of controlling increased cyanoglucoside content in cassava tubers by applying nitrogen as a foliar spray. The present study was undertaken to see the feasibility of controlling cyanoglucoside content in roots of cassava by applying growth regulators.

For this study, stem cuttings of cassava H-57, a hybrid evolved at this Institute, having 6-8 buds were given a pre-soaking treatment for sixteen hours with various growth regulators like NAA, IAA, IBA and IPA at 10 to 50 ppm and distilled water was used in case of control. The treated cuttings were planted in pots containing saw-dust and watered according to the requirement. Fifteen cuttings were used in each treatment and on 30th day, HCN content in roots was estimated by colorimetric method[6]. Results are tabulated in Table I.

TABLE I

Effect of growth regulators on HCN content in roots of cassava

Concentration used (ppm)	% Reduction of HCN content with			
	NAA	IAA	IBA	IPA
Ist Experiment				
10 ..	24	42	36	23
50 ..	33	54	39	39
II Experiment				
5 ..	9	31	18	27
10 ..	22	50	36	24
25 ..	45	47	42	37
50 ..	36	50	36	40
75 ..	54	55	55	55
100 ..	45	55	45	55

From Experiment I, it is evident that the HCN content in roots is considerably reduced by the various growth regulators tested and the effect of these regulators was more pronounced at higher concentration (50 ppm).

To find out the minimum concentration, at which maximum reduction of HCN occurs, different concentrations of the growth regulators were tried and the results (Experiment II) indicate that although the maximum effect on reducing HCN content was noted at 75 ppm concentration, invariably in all the treatments, the optimum concentration for these growth regulators was found to be 25 to 50 ppm.

The reduction in HCN content in roots may be attributed to the fact that these growth regulators may be taking part in suppressing the biosynthesis of cyanoglucosides in the roots. In this regard, many growth regulating substances have already been reported to regulate the metabolism of different tissues[7]. Recently, it has been observed that these growth regulators increase the number of roots and consequently more number of tubers. The present experiment illustrates that they also reduce the HCN content. Hence it seems that these growth regulators may play a vital role in improving this crop.

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DEFECTIVE STIGMATIC EXUDATE AS A FACTOR IN THE STERILITY OF *IMPATIENS*

STERILITY in plants can be caused by a variety of events that interfere with the development of mega or micro gametophytes[1]. In two vegetatively propagating and apparently sterile species of *Impatiens*, (*I. beddomei* and *I. sultani*) cytological abnormalities occur at several stages from the formation of microspore mother cell onwards[2]. Nevertheless, they produce considerable quantities of apparently normal pollen grains. Aceto-carmine and germination tests revealed that about 38% of the pollen grains in *I. beddomei* and 2% of that of *I. sultani* were viable. Against this, the fertile species, *I. balsamina*, produced about 98% viable pollen grains. The increase in size of the ovary and the development of ovules up to anthesis seemed to be alike in all species.

The high percentage of non-viable pollen is apparently the main factor responsible for the sterility of these two species. However, it seemed intriguing that even in *I. beddomei*, where 38% of the pollen grains were viable, no fruit setting was recorded. It was therefore necessary to examine whether factors

inhibiting pollen germination were responsible for the failure to set seeds in the two species.

The role of stigmatic secretions in the germination of pollen grains is well known. The dominating groups in the exudates are lipids and phenolic compounds[3,4]. More than 30 of these compounds were found in *Zea mays*[5]. The chemical nature of the stigmatic exudates vary from plant to plant, but for each species the composition of the exudate is a stable trait and has a direct bearing on the germination of compatible pollen.

A comparison of the chemical composition of the stigmatic fluid of the three species of *Impatiens* was made by analyzing their total UV absorption profiles. The exudates were extracted from stigmas in 95% ethyl alcohol and the absorption profile was determined with a Beckman U 2 Spectrophotometer. Bathochromic shifts were calculated by studying the absorption profiles of extracts made alkaline with NaOH.

Extracts from both sterile and fertile species strongly absorbed UV light below 250 mμ. *I. balsmaina* and *I. beddomei* had an absorption peak at 240 mμ while the peak for *I. sultani* was at 232 mμ. Peaks in this region are a feature of many species besides *Impatiens*. According to Martin[6], these peaks represent unsaturated aliphatic chains and because of their wide occurrence are considered to have no taxonomic significance.

In the 250-400 mμ region the fertile and sterile species show marked dissimilarities. Both *I. sultani* and *I. beddomei* show no peak in this region. The fertile species, *I. balsamina*, however, has a well defined peak at 322 mμ. When NaOH was added to the extract the peak underwent a bathochromatic shift to 356 mμ (Fig. 1).

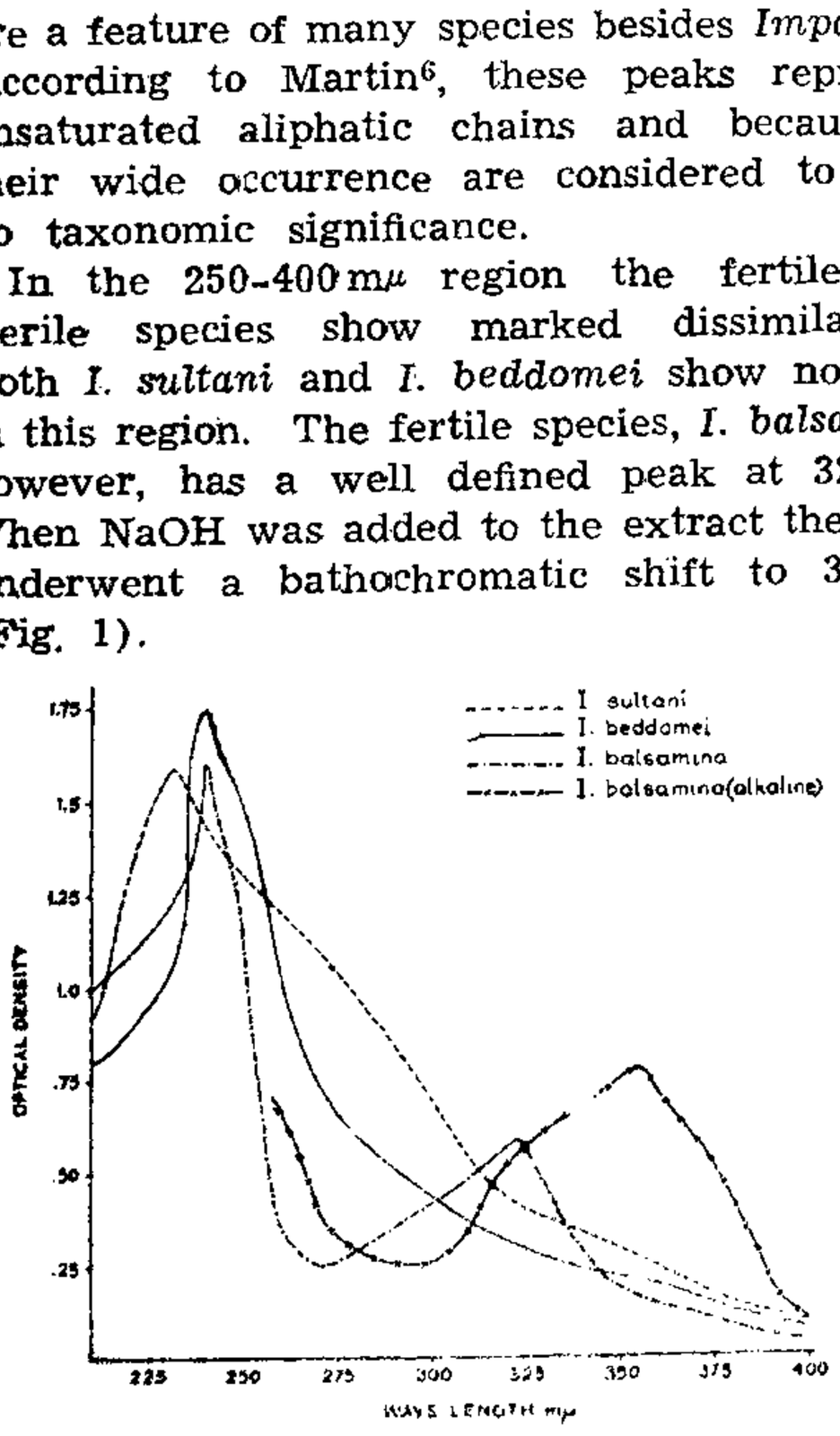

FIG. 1. UV absorption curves.

A single well defined peak suggests that one principal 'compound or group of compounds exist. In a study of the effect of alkali on ultrviolet absorption spectra, Lemon[7], points out that phenolic compounds, on being made alkaline undergo a bathochromatic shift. The shift seen here may, therefore, be an indication of the presence of phenolic compounds. In a detailed study of some members of the family Convolvulaceae, Martin[6] observed that the absorption peaks of their stigmatic exudates occur at 326 or 327 mμ with bathochromic shifts varying from 56-60 mμ. On a comparison with known peaks and shifts of purified compounds, Martin[6] suggests that the compounds might be esters of caffeic acid. But the fertile species of *Impatiens* show a peak at 322 mμ with a shift of 34 mμ. This value is nearer to that of chlorogenic acid, whose peak is at 324 mμ with a shift of 37 mμ, than to those of esters of phenolic acids.

As seen from Fig. 1, both sterile species do not have any absorption peak in the 250-400 mμ region. However, a peak is exhibited by the fertile species in this region which, as shown above, may be indicative of the presence of phenolic compounds. In the literature, the role of phenolic compounds as stimulants to pollen germination is stressed[4,6,8]. The absence of these constituents in the stigmatic fluid would evidently affect the germination of even viable pollen grains that might be transferred to the stigmas. The defective stigmatic exudates may therefore be a contributive factor to the sterility of *I. beddomei* and *I. sultani*.

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