

## CHROMOSOME STUDIES IN THE GENUS *IPOMAEA*

THE genus *Ipomæa* includes several economic plants and many garden favourites. King and Bamford (1927) have published a list of chromosome numbers of several species in this genus. This list does not include some species of *Ipomæa*, for example, *I. pulchella* Roth., *I. carnea* Jacq., *I. reptans* Poir. Kano (1929) has reported the haploid number of *I. batatas* Lamk. as 42 and King and Bamford, however, estimate the diploid number to be 90.

Both mitosis and meiosis were studied. Roots were obtained from the cuttings. All the materials were fixed in CrAF and stained by iron-alum-hæmatoxylin. As the Figs. 1-3 show,

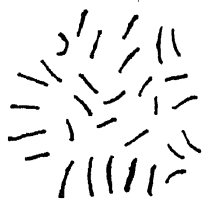


Fig. 1.



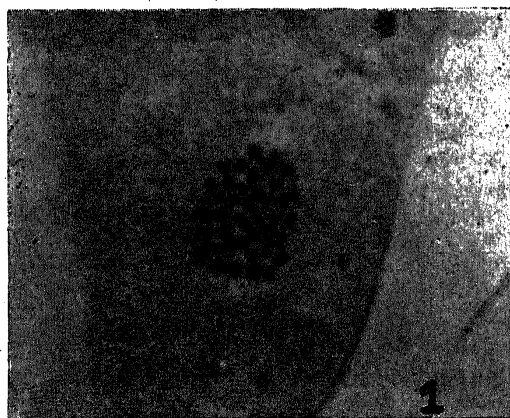
Fig. 2



Fig. 3

Mitotic metaphase plates 1. *I. carnea*.  $2n=30$  2. *I. reptans*.  $2n=30$ . 3. *I. pulchella*.  $2n=30$

*I. carnea*, *I. pulchella*, *I. reptans* have  $2n$ , 30. The diploid number of *I. batatas* is 90. In *I. batatas* somatic pairing was found among the chromosomes in pairs in majority of plates.

PLATE I.—Meiotic II metaphase in *I. batatas*.  $n=45$ 

In meiosis, stages from diplotene to anaphase were available for study. Fifteen bivalents were formed in both *I. carnea* and *I. pulchella*. The diplotene bivalents showed both terminal and interstitial chiasmata. In *I. carnea*, secondary association among the bivalents was noticed in majority of plates. The haploid number of *I. batatas* was found to be 45. (Plate I).

The plants under study showed some abnormal features. 'Syndiploid' cells or two- to three-nucleate p.m.c. were observed in *I. carnea* and *I. pulchella*. 'Syndiploidy' has been previously reported by several workers in *Lactuca* (Gates and Rees, 1921), *Prunus* (Darlington, 1928), *Brassica* (Karpechenko, 1927). Darlington (1937) considers this phenomenon as a racial or genetic character.

I wish to thank late Dr. V. K. Badami, Ph.D. (Cantab.), for initiating the work, and Mr. S. Sampath for bringing it to completion.

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## STUDIES IN VITRO OF SOME SULPHANILAMIDE DERIVATIVES

TREFOUËL *et al.*<sup>1</sup> observed that  $N^4$ -sulphanilamide acetic acid is a good bacteriostat *in vitro*. In view of this Bami, Iyer, and Guha<sup>2-5</sup> synthesised a number of aliphatic esters and acids substituted at  $N^4$ -position of sulphanilamide as well as certain alkylene bis-sulphanilamide and their  $N^1$ - and  $N^4$ -substituted derivatives.

The bacteriostatic activity of some of these compounds was determined both by the Oxford cup method with *Staphylococcus aureus* and by the turbidimetric method with both *Staphylococcus aureus* and *Streptococcus hemolyticus*.

All the compounds mentioned in the table were soluble in water and had a maximum pH of about 8.

Compounds No. 13 and 14 are a few of the antimalarial drugs of the sulphanilamide-biguanide type while compound No. 15 is a salt of Paludrine.<sup>6</sup>

The table shows that in general the compounds are equally effective against both types of organisms. Compounds No. 1, 11 and 14 however, inhibit *Streptococcus hemolyticus* at a concentration much less than is required for *Staphylococcus aureus*.

Our thanks are due to Prof. P. C. Guha, Dr. K. P. Menon for their kind interest and help during the course of this investigation.

Bacteriostatic activities of some sulphanilamide derivatives

Compound	Maximum dilution which is active against	
	Staphylococcus aureus	Strepto hemolyticus
1. Ethylene-bis-N <sup>4</sup> -sulphanilamide <sup>2</sup>	1:1000	1:5000
2. Methylene-bis-N <sup>4</sup> -sulphanilamide <sup>2</sup>	1:2000	1:2000
3. Trimethylene-bis-N <sup>1</sup> -sulphanilamide <sup>2</sup>	1:1000	1:1000
4. Ethylene-bis-N <sup>4</sup> -(N <sup>4</sup> heptyl-sulphanilamide) <sup>3</sup>	1:1000	1:1000
5. Ethylene-bis-N <sup>4</sup> -(N <sup>1</sup> acetyl-sulphanilamide) <sup>3</sup>	1:1000	1:1000
6. N <sup>4</sup> -Sulphanilamido-acetic ester <sup>4</sup>	1:1000	1:1000
7. N <sup>4</sup> -Sulphanilamido-acetic acid <sup>1, 4</sup>	1:2000	1:2000
8. N <sup>4</sup> -Sulphanilamido-propionic ester <sup>4</sup>	1:10000	1:1000
9. N <sup>4</sup> -Sulphanilamido-butyric ester <sup>4</sup>	1:1000	1:1000
10. N <sup>4</sup> -Sulphanilamido-malonic ester <sup>4</sup>	1:1000	1:1000
11. N <sup>4</sup> -Sulphanilamido-phenyl acetic ester <sup>4</sup>	1:1000	1:5000
12. N <sup>4</sup> -Sulphanilamido-phenyl acetic acid <sup>4</sup>	1:1000	1:1000
13. N <sup>1</sup> -p-chlorophenyl-N <sup>5</sup> -p-sulphonamido-phenyl biguanide hydrochloride	1:1000	1:1000
14. N <sup>1</sup> -p-chlorophenyl-N <sup>5</sup> -p-phenyl sulphonamido-2-thiazole-biguanide hydrochloride	1:1000	1:5000
15. N <sup>1</sup> -p-chlorophenyl-N <sup>5</sup> -isopropyl-biguanide acetate (Paludrine) <sup>6</sup>	1:1000	1:1000

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died the cytology of regenerating livers. This was under the belief that partial removal should accelerate mitotic division and bring to light the chromosomes and thus afford evidence regarding the constitution of the nuclei of glandular cells.

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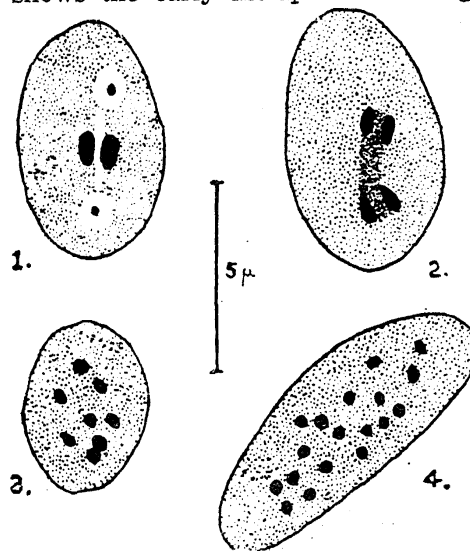
ENDOPOLYPLOIDY IN YEASTS

ARE fermenting cells comparable to actively secreting glandular cells? As far back as 1910, Wager and Peniston<sup>1</sup> suggested such a comparison. And yet, the importance of the above suggestion does not appear to have been realized by later workers. Anyone conversant with the cytology of glandular secretion (Bowen<sup>2</sup>) would be aware that secretory cells take their origin from embryonic replacement cells. Gland cells themselves fall into two distinct categories. In the "holocrine" type, the cells die after a single secretory cycle, while in the "merocrine" type, they pass through several secretory cycles before death supervenes. It has been known for the past one decade that merocrine cells show various degrees of endopolyploidy (White<sup>3</sup>). Some of the remarkable advances in our knowledge of the genetics of *Drosophila* are based on the study of polytene chromosomes in the endopolyploid nuclei of the salivary gland cells. Resting nuclei of gland cells may or may not show polytene chromosomes. In fact, in many cases their endopolyploid constitution could only be inferred. Cancer cells possess an inherent impulse for rapid multiplication, and it appears that polytene chromosomes could be observed during stages of division (Biesele<sup>4</sup>). Gland cells show only occasional metaphases and the earlier controversy regarding the behaviour of the nucleus in gland cells (Kater<sup>5</sup>) is reminiscent of a similar state of affairs in yeasts (Nagel,<sup>6</sup> Lindgren<sup>7</sup>). To investigate the question whether the failure of gland cells to divide mitotically is the result of their highly endopolyploid constitution Brues and Marble<sup>8</sup> and Biesele<sup>4</sup> stu-

If fermenting yeast cells are endopolyploid, then it should be possible to demonstrate the same by experiments planned on similar lines. Just as surgical removal accelerates mitotic division in the liver, replacement of the spent wort with fresh medium in fermenting cultures produces the same effect.

Therefore, tubes of wort were inoculated with the brewery strain Sc. 9 and after the lapse of five days the spent medium was poured out and replaced with the same quantity of fresh medium. The contents of the tubes were centrifuged and smeared at five-minute intervals commencing from 40 minutes after the addition of fresh medium. The descriptions are based on Feulgen preparations.<sup>9</sup>

The mitotic cycle during the aerobic phase has already been described for this strain.<sup>10,11</sup> Fig. 1 shows the early metaphase showing the



two chromosomes, the centrioles with their centrospheres and the developing spindle. In Fig. 2 is shown the anaphase.