

## EFFECTS OF THUJA OCCIDENTALIS ON THE MITOTIC ACTIVITY OF PLANT CELL

DR. BALARAM JANA, M.SC., D.M.S., P.G.R. (Bombay), Burdwan

**ABSTRACT:** A cetoorceine HCl mixture squash preparation of *Allium cepa* root-tip cells grown on different potencies (1X, 3X, 30, 200, 1000 and CM) of *Thuja occidentalis* show that this medicine causes increase in the mitotic index, promoting DNA synthesis.

### INTRODUCTION

The principle of minimum dose (as propounded by Dr. Samuel Hahnemann by applying on an experimental basis a small dose of a crude drug on his own healthy body) is novel and unique to homoeopathic system of medicine. Hahnemann demonstrated that with the gradual quantitative diminution of a drug substance the latent dynamic curative force of a medicine is aroused with increasing activity. Thus, the greater the diminution of a drug substance, the more the curative power of the medicine.

The most common and accepted homoeopathic potencies or dynamic power from the latent crude drugs (from vegetable, animal, mineral, chemical and other sources) are 1x (mother tincture), 2x, 3x, 6, 30, 200, 1000, 10M, 50M and CM. Homoeopathic mother tincture is equivalent to 1x potency. The 2x potency is prepared by mixing one part of mother tincture and nine parts of alcohol and giving the mixture ten downward strokes ending in a jerk. The 3x potency is prepared by mixing one part of the 2x potency and nine parts of alcohol and giving similar ten strokes. Likewise, 4x, 5x, 6x potencies are prepared in the decimal scale which is indicated by the letter x at the end of a numeral.

Medicines are also prepared in the centesimal scale. The process is similar except that here one part of mother tincture or previous potency and 99 parts of alcohol are taken. The potencies are indicated with numerals 1, 2 etc. without suffix or with suffix c.

Thus, 3rd centesimal potency contains one hundred thousandth part. 4th centesimal potency contains 10 millionth part. 5th centesimal potency one billionth part and 6th centesimal potency one hundred billionth part of original one drop of mother tincture. In this process when one hundred thousand, i.e. CM potency is prepared from the original one drop of mother tincture the calculation of the material portion, if there be any such element at all in one drop of this last potency, goes in the realm of finer mathematical calculations. One drop of CM (1,00,000) potency or the highest homoeopathic potency contains besides alcohol an astronomically small portion of the original one drop of mother tincture or crude drug substance. But it is astonishing to note that such an infinitesimally minute quantity of the active drug substance have a miraculous and far reaching effect on biological system.

In this background the present investigation was undertaken to assess the validity of the very concept of homoeopathic potentisation by evaluating the effects of different potencies of a particular medicine on the cytological behaviour of a test plant material.

#### MATERIALS & METHODS

In tact healthy roots of *Allium cepa* were kept immersed in jars containing solutions prepared by adding 5 drops of the different potencies of the homoeopathic medicine *Thuja occidentalis* in 50ml distilled water. The potencies chosen were  $\phi$  (mother tincture) 3x, 30, 200, 1000 and CM. Two sets of control were kept, one in pure distilled water and the other in a solution prepared by adding 5 drops of the solvent (alcohol) in 50 ml distilled water.

Two to three root tips of about 2 mm length of onion bulbs were cut at about 24 hour intervals rinsed in distilled water and fixed in a mixture of acetic acid and absolute alcohol (1:2) for 1 hour. These were then kept in 45% acetic acid for 10 minutes after which they were gently warmed in a mixture of acetoacetic acid & hydrochloric acid (9:1). The root tips were taken out from the fluid after 30 minutes and squashed in 45% acetic acid for microscopical observation. Data for mitotic index were recorded as suggested by Bhalla *et al* (1973).

#### RESULT

The result is given in a tabular form overleaf.

#### DISCUSSION

The data recorded on mitotic index have been presented in figures 1 & 2. It is evident from the data presented that treatment with the homoeopathic medicine, *Thuja occidentalis*, in all potencies causes increase in the mitotic index or cell division frequencies in comparison to the control. It is to be noted that while in control set no. 2 in which only the solvent (alcohol) was added to distilled water, the mitotic index declined very rapidly. This is in confirmation with the earlier report on the cytotoxic effect of alcohol (Arcara *et al* 1967). The other sets of experiment in which the medicine *Thuja occidentalis* was added showed remarkable increase in mitotic index surpassing the control in pure distilled water also. This evidently indicates that the drug which is nothing but an alcoholic potentisation of the plant *Thuja occidentalis* has pronounced effect in enhancing the cell division frequencies. According to the homoeopathic provings, *Thuja occidentalis* is an excellent drug used in the effective treatment and cure of various types of warts and tumours in human body (Hering 1879). It seems a paradox rather to note that the medicine which controls abnormal growth like tumours and warts in human body induces an overall enhancement in mitotic activity in test plant system.

It is also evident from the data gathered in course of this investigation

TABLE  
MITOTIC INDEX  
(Percent of cells belongs to the division with respect to the total number of cells observed)

	Total No. of cell observed	No. of cells in divn.	Mitotic index	Total No. of cells observed	No. of cells in divn.	Mitotic index	Total No. of cells observed	No. of cells in divn.	Mitotic index	Total No. of cells observed	No. of cells in divn.	Mitotic index
Control sets:												
No. 1 (in distilled water)	595	49	7.05	835	61	7.31	1005	79	7.86	1080	88	8.14
No. 2 (in alcohol)	—	—	—	800	41	5.12	845	38	4.49	910	39	4.28
Medicinal sets:												
No. 1 Thuja occi. $\phi$	—	—	—	890	109	12.25	690	76	11.01	885	92	10.39
No. 2 Thuja occi. 3x	—	—	—	700	119	17.00	960	160	16.68	910	142	15.60
No. 3 Thuja occi. 30	—	—	—	775	94	12.16	970	119	12.25	1020	147	14.41
No. 4 Thuja occi. 200	—	—	—	820	98	12.00	1005	124	12.37	1075	155	14.42
No. 5 Thuja occi. 1000	—	—	—	710	78	10.95	880	111	12.56	935	163	17.44
No. 6 Thuja occi. CM	—	—	—	735	74	10.12	905	107	11.86	960	140	14.60

that the mode of activity of this medicine with regard to enhancement of cell division varies distinctly with change in its dilution or potency. Lower dilution that is 1x or 3x reaches the peak of activity (MI 12.25 and 17.00) within a very short time (24 hrs.) and it descends rapidly thereafter. On the other hand in higher potencies (30 and above) action is slow but continues for a longer period progressively increasing with the duration of treatment (Figs. 1 & 2). This is in agreement with the concept of minimum dose as mentioned in introduction. However, the maximum level of activity was observed with 1M potency (MI 17.44 in 72 hrs. of treatment) whereas, with

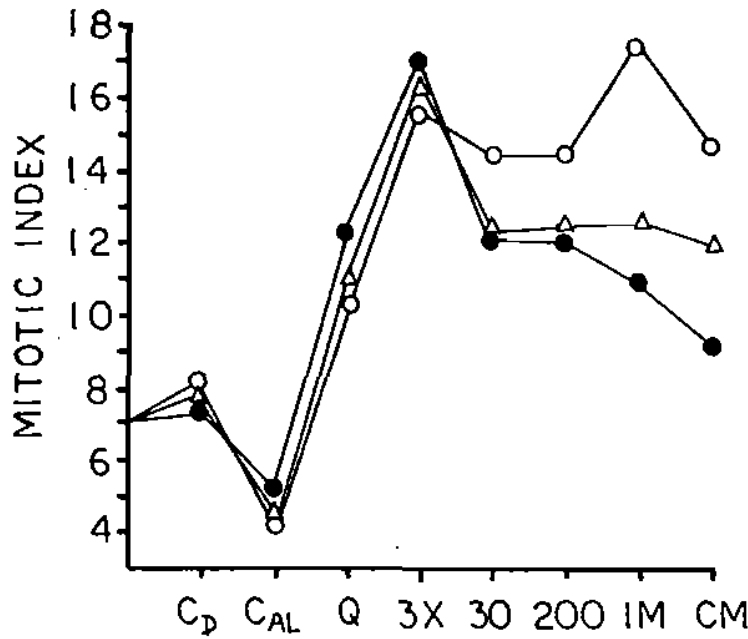


Fig. 1.

Control and different potencies of *Thuja occidentalis*

- 24 hrs.
- 72 hrs.
- △—△ 48 hrs.
- C<sub>D</sub>—Control dist. water
- C<sub>AL</sub>—Control alcohol

further increase in the potency to CM although the mitotic index at 72 hrs. was of a comparatively lower order (MI 14.60), even then mode of progressive increase in the mitotic activity with longer duration of treatment is maintained (Fig. 2) suggesting thereby that the possibilities of a higher peak beyond 72 hrs. of treatment may not be ruled out in CM potency.

Taking into account Avogadro's law it has been worked out that beyond the 12th centesimal or 24 decimal potency it is unlikely that a single molecule of the original medicinal substance will be present in any dose adminis-

tered to the patient (Weiner & Goss 1982). It is a riddle, therefore, to note how *Thuja occidentalis* in potencies as high as 1M or CM which contains only alcohol (solvent) besides an astronomically small portion of one drop of original mother tincture, can have a significant effect on cellular system as noticed in the present investigation. This requires proper explanation in the light of modern science.

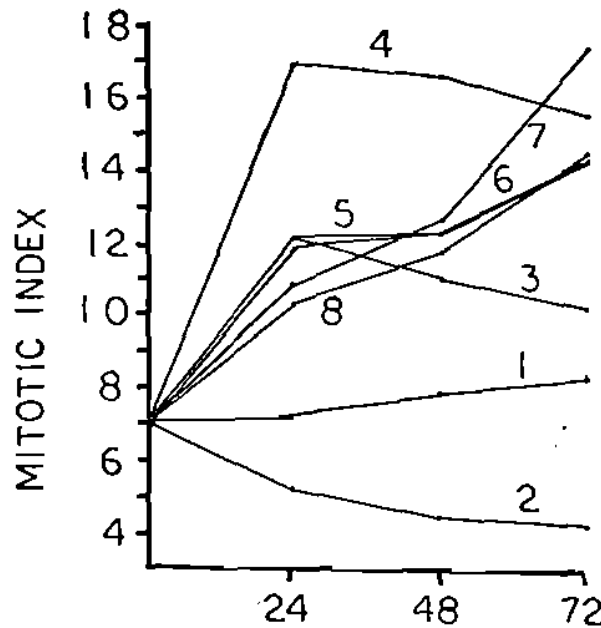


Fig. 2.

Duration of treatments in hours

- |                         |                     |
|-------------------------|---------------------|
| 1=Control (dist. water) | 2=Control (alcohol) |
| 3=Thuja occi. 0         | 4=Thuja occi. 3x    |
| 5=Thuja occi. 30        | 6=Thuja occi. 200   |
| 7=Thuja occi. 1M        | 8=Thuja occi. CM    |

## ACKNOWLEDGEMENTS

The author is greatly indebted to Dr. Amiyanshu Chatterjee of the Centre of Advanced Studies in Cell and Chromosome Research Department of Botany, University College of Science, Calcutta for his constant guidance and critical advice in this research work.

He also feels himself privileged to sit and study for several years at the feet of Padma Bhusan Dr. Arun Kumar Sharma, President, Indian Science Academy, Science Congress, 1981 and Head of the Department of Botany, University College of Science without whose inspiration, guidance and patron-

(Continued on page 31)

## QUERY AND REPLY

**Q.** What is a fluxion potency?

**A.** The potency prepared by the force of a stream or streams of water squirted into a container containing the lower potency of a remedy is known as fluxion potency. Ordinarily the 10M, 50M and CM potencies are prepared by this method.

---

### EFFECTS OF THUJA OCCIDENTALIS ON THE MITOTIC ACTIVITY OF PLANT CELL

(Continued from page 28)

age this work would not have seen the light of the day. He wishes to thank Mr. Bhibhuti Bhusan Biswas for his careful examination of the manuscript and constructive criticism.

#### REFERENCES

1. Arcara, P. G. and Ronchi, Nuti, V.: 'Effect of Ethylalcohol on the Mitotic Cycle of *Allium cepa* Menistems', *Carologia*, (1967) 20 : 229-232.
  2. Hahnemann, S.: *Organon of Medicine* (1833), translated from 5th German edition by R. E. Dudgeon (1893), Indian ed., New Delhi : B. Jain Publishers (1967).
  3. Hering, C.: *The Guiding Symptoms of Our Materia Medica*, 10 : 337, Indian ed., New Delhi : B. Jain Publishers (1971).
  4. Weiner, M. C. and Goss, K.: *The Complete Book of Homoeopathy*, 127. U.S.A.: Bantam Books (1982).
-