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HUMAN HEALTH AND MINOR MINERALS

Part II. Studies of the Chewing Effect of *Gymnema sylvestre* (Gurmar Buti)

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It has been observed that *Gymnema sylvestre* when chewed, causes hypogeusia (loss of taste investigate acuity). A trace metals analysis was carried out to investigate this fact. The presence of excessive amounts of copper (197 ppm) provides a clue towards this observation. Copper can easily replace zinc from the gustin protein present in the saliva, creating deficiency of zinc. The temporary deficiency of zinc creates this loss of taste acuity for a short period of time.

Key words: Taste acuity; Copper; Zinc.

INTRODUCTION

It has been mentioned in the old books of the Islamic system of medicine that the chewing of *Gymnema sylvestre* takes away the power of taste [1, 2, 3]. This herb is known as *gurmar buti* in the Punjab because the chewing of this herb, followed by the eating of gur (jaggery), gives no sense of sweetness. Old physicians considered that by eating this herb, the excessive amount of the sweet material in the body will be consumed and diabetes cured. The real fact is that the presence of chromium in the herb is one of the major factors controlling diabetes although, there is no direct link between the loss of taste and diabetes. Later on, Edgeworth noticed that when the leaves of *Gymnema sylvestre* were chewed, the power of the tongue to appreciate the taste of sugar and all other saccharine substances was abolished [4]. This was later confirmed by Hooper [5] who observed that the leaf also had the valuable property of completely removing the taste of a bitter substance like quinine. The loss of these sensations lasts only for one to two hours. On account of its property of doing away the taste of sugar it has been given the name of *gurmar* (from *gur*, raw sugar, and *mar*, to kill) meaning sugar destroying. Hooper [6, 7], in 1887 carried out a chemical analysis of the leaves of *G. sylvstre* and found hestriacolen ($C_{21}H_{64}$), quercitol, gymnemic acid and 11.45% inorganic material. The organic compounds were applied individually on to the tongue to the observe hypogeusia effect but no positive indications were forthcoming.

Scientific literature indicates that the deficiency of zinc in the human body drastically affects the taste buds of human beings. Acute deficiency of zinc totally takes away the sense of taste [8, 9, 10]. The aim of this study was to find the active ingredient affecting the sense of taste.

EXPERIMENTAL

Gymnema sylvestre. (*Gurmar Buti*) Leaves of *G. sylvestre* were collected from a local herb seller. The leaves were dried and turned to ash at 900° which took 5 hr.

Hydrochloric acid. Analar Grade HCl was used for the preparation of solution for atomic absorption studies without further purification.

Preparation of solution for atomic absorption studies. 100 g. of *Gymnema sylvestre* leaves were taken for experimental work. The ash of the above-mentioned herb was prepared by burning the material at 900° in an electrically-heated oven (Thermolyne type 1300 Furnace). It was observed that higher temperature increases the amount of insoluble materials. The ash was first treated with 10% HCl, then with 20% HCl and finally with concentrated HCl. All the coloured material went into solution which was 8.5% of the total material. About 1.5% of a white insoluble material remained. The solution was made upto 250 ml by adding distilled water for atomic absorption studies.

Measurements of absorption were carried out in the ketone phase by using the Perkin Elmer 280-B atomic absorption spectro-photometer with lamps having different wavelengths. The results are given in the Table 1.

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Table 1

	Average μg/g.		
	Chromium	Zinc	Copper
G. sylvestre	(Cr)	(Zn)	(Cu)
(*Gurmar buti*)	15	73	197

DISCUSSION

It is an established fact that the deficiency of zinc in the human body creates a loss of taste acuity and it has also been reported that there is a synergistic effect of the amounts of copper and zinc which can remain inside the body. Large intake of copper decreases the amount of zinc inside the human body.

Gustin, a salivary protein containing 2 moles of zinc, has been isolated from a normal subject [10]. *G. sylvestre* contains an amount of copper which can replace zinc in gustin. When the temporary displacement of zinc takes place in gustin, because of this displacement, the taste temporarily goes away. With the circulation of blood and other metabolic changes, zinc takes its original place and the sense of taste comes back. The loss of zinc due to the chewing of *G. sylvestre* may be one of the major causes in losing taste acuity. The chemical constituents of the herb did not produce the loss of taste acuity though application on the tongue. A similar type of phenomenon has been observed when caffein takes the place of adenosine in the mind receptacles for a short period and the efficiency of mind increases. After two or three hours caffein molecules vacate the mind receptacles. Men feel weary after the removal of caffein molecules from the receptacles of the mind.

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REFERENCES

1. A.K. Nadkarni's *Indian Materia Medica,* (Popular Book Depot, Bombay, 1954), p. 596.
2. Power and Tutin, Pharm. J., 234 (1904).
3. R.N. Chopra, J.P. Bose and N.R. Chatterjee, Indian Med. Res., 16 July 1928.
4. Mhaskar and Caius, Indian Med. Res., March 1 (1930).
5. Col. Sir R.N. Chopra, *"Indigenous Drugs of India,"* (U.N. Dhur and Sons, Calcutta 12, 1958).
6. Hasan Jamal, Hasan Raza, K. M. Janjua and M.K. Bhatty, Pakistan J. Sci. Ind. Res., **29**, 6 (1986).
7. T. Ogiso, N. Ogawa and T. Miura, Chem. Pharm. Bulk, **27**, 515 (1979).
8. K.M. Hambridge, C. Hambridge, M. Jacolis and J.D. Pediat. Res., **6**, 868 (1972).
9. K.M. Hambridge and P.A. Walravens, *"Trace Elements in Human Health and Disease,"* pp. 21-32, Vol. I, (Academic Press, New York, 1978).
10. R.I. Henkin, R.E. Lippoldt, J. Bilstad and H. Edelhock, PNOC Nat. Aca. Sci., USA **72**, 488 (1975).