

The optimum temperature is 30°C., growth being very poor at lower or higher temperatures. The optimal pH is 7.0-7.4. The thermal death point is 60°C.

The organism grows well in liquid media containing sulphates, sodium chloride, phosphates, sodium lactate, and ammonium salts. Presence of traces of iron salts facilitates growth and renders the visual observation of the reduction easy.

The organism does not reduce nitrates. It accomplishes the reduction of sulphites, thio-sulphates and free sulphur.

REDUCTION OF SULPHATES IN SOILS OF KNOWN COMPOSITION

Pure acid-washed sand, moistened with the nutrient solution containing all the essential salts, was intimately mixed and dried at 90°C.; this facilitated an even distribution of the salts in the entire mass of the sand.

Cylindrical jars of uniform size (12" × 1½") were filled first with about one-third its height with the treated sand; 10 ml. of a uniformly suspended active culture added and then covered with an other batch of the same sand. Each jar contained 250 gms. of the sand. The sand in each jar was wetted with compounded sea-water until a head of 1" of water remained at the top. A control jar with the sand, identically treated, but with no inoculum, was maintained.

Distinct black bands were visible on the fourth day and these bands gradually developed in width upto about the fifteenth day.

It thus seems justifiable to conclude that *Vibrio desulphuricans*, Konæ is responsible for the production of sulphuretted hydrogen formed in the sulphur-bearing area. Further experiments with a view to initiate the process of sulphate reduction in areas other than the sulphur-bearing areas are in progress. We wish to tender our grateful thanks to the Government of Madras for the generous support of a scheme, of which these studies form a part. Our thanks are also due to Sir J. C. Ghosh for his kind interest in the course of these investigations.

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ELECTRICAL TRANSMISSION AT NERVE ENDINGS

In previous communications (Singh and Sehra, 1945; Singh, Sehra and Mrs. Singh; Singh, 1945), we have described differences between the effects of stimulation of the frog heart and unstriated muscle by nerves and by acetylcholine. We have now come across frogs the tissues of which show these differences in a more striking manner.

In the present experiments from gastrocnemius

mus was stimulated electrically, through its nerve, or by acetylcholine (1 in 10⁵) and frog rectus was stimulated with alternating current by Winton's method or by acetylcholine. The frog gastrocnemius was stimulated alternately through its nerve and by acetylcholine every five minutes, so that the responses to nerve stimulation and acetylcholine were recorded in the same muscle under identical experimental conditions.

The rectus abdominis was insensitive to acetylcholine, but hypersensitive to alternating current (12 experiments). This was surprising in view of the fact that this muscle is used for the assay of acetylcholine. Out of 12 gastrocnemii, 6 were found to be insensitive to acetylcholine (1 in 10³), and the other 6 gave feeble responses with 1 in 10⁵ acetylcholine, but all these muscles were found to be hyperexcitable to nervous stimulation or to alternating current. It was possible to vary the excitability to these two agencies in the opposite directions. Thus in the absence of calcium, the muscle at first became hyperexcitable to nervous stimulation and acetylcholine, but within 15 minutes, it became inexcitable to the former, but remained hyperexcitable to the latter. As the concentration of calcium was increased, the excitability to nervous stimulation increased, and that to acetylcholine decreased, the optimum concentration of calcium for the former being 0.02 M CaCl₂. The muscle could thus be rendered inexcitable to acetylcholine and hyperexcitable to nervous stimulation and vice versa. Replacement of the chloride of the saline with bromide, nitrate and iodide at first increased the excitability to both, but after ten minutes affected them in opposite directions (Fig. 1).

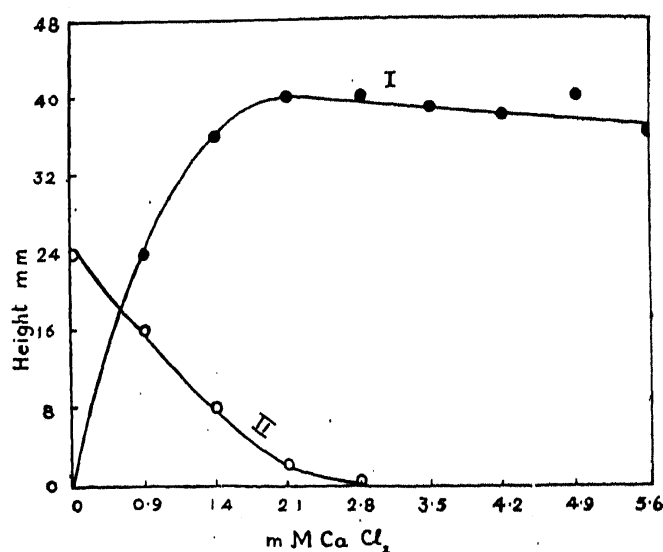


FIG 1.—Frog gastrocnemius. Effect of stimulation through nerve (1st curve) and by acetylcholine (1 in 10⁵; 2nd curve) with varying calcium concentration.

Contraction produced by acetylcholine, thus belongs to the potassium group (Singh, 1938), and that by nervous stimulation to the alternating current group. The two are thus antagonistic. As the contraction produced by alternating current is a propagated one, these experiments show that the transmission of the

nervous impulse at the myoneural junction is electrical rather than chemical.

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APPARENT CAROTENE AND VITAMIN C IN DEHYDRATED VEGETABLES

It was reported earlier¹ that the purification of crude petroleum ether extracts of carotene by washing with 90 per cent. methyl alcohol is unsatisfactory because some non-carotene, biologically inactive pigments remain in the petrol layer and are estimated inaccurately as carotene. The degradation products which occur in considerable amounts in stored food-stuffs, can be removed by adsorption on a column of dicalcium phosphate. Similar artifacts have been now shown to develop during the dehydration of vegetables and increase on subsequent storage.

An aliquot of the extract, after phase partition was purified by chromatography and the unadsorbed carotene estimated on the Pulfrich photometer. A considerable portion of the "carotene" in the epiphasic layer consisted of some degradation product exhibiting a non-specific absorption spectrum and being chromatographically separable from carotene. It is reported² that carotene is reasonably stable in

can be applied for the non-specific reductants. The results given in Table II indicate that the artifacts which appear to be mainly reductones are developed during the dehydration and increase on storage.

These results emphasise the need for employing the improved technique for the accu-

TABLE II.—Ascorbic acid in mg. per 100 g. of vegetable on moisture-free basis

Vegetable	Treatment	Harris and Olliver's method	Mapson's method	Non-ascorbic acid reductants
Potato ..	Fresh	104	104	0
	Blanched	107	107	0
	Dehydrated	71.0	70.2	1.2
	Dehydrated and stored for 16 weeks	19.7	12.7	35.5
Bittergourd	Fresh	1480	1480	0
	Blanched	1177	1177	0
	Dehydrated	193	154	20.0
	Dehydrated and stored for 8 weeks	130	100	23.2
Cabbage ..	Fresh	549	549	0
	Blanched	439	439	0
	Dehydrated	300	264	11.9
	Dehydrated and stored for 10 weeks	40.2	23.9	40.4
Spinach ..	Fresh	414	414	0
	Blanched	281	281	0
	Dehydrated	92.9	53.9	42.0
	Dehydrated and stored for 9 weeks	0	—	—

TABLE I.—Carotene µg. per gram of vegetable on moisture basis

Vegetable	Fresh			Dehydrated			Dehydrated and stored				
	Phase partition	Chromatography	Non-carotene pigment	Phase partition	Chromatography	Non-carotene pigment	Period of storage	Phase partition	Chromatography	Non-carotene pigment	Loss in carotene
			%			%	Weeks			%	%
Bitter-gourd	25.7	25.7	0	24.1	23.6	2.0	8	22.8	16.6	27.2	35.3
Carrots	855	850	0.0	842	812	3.6	8	469	452	3.7	46.9
Spinach	727	—	—	567	428	24.6	9	331	223	30.6	69.3
Cabbage	341	341	0	280	214	23.6	11	155	74.4	52.0	78.2

dehydrated vegetables, but when estimated by this method, the loss appears to be serious.

The vegetables were dehydrated as recommended by Prescott and Proctor³ and stored in air-tight tins at room temperature.

Mapson's⁴ observation that dehydrated vegetables contain reducing substances which interfere with the estimation of ascorbic acid by titration with 2:6-dichlorophenolindophenol has been confirmed. Ascorbic acid was determined in vegetables—fresh, blanched, dehydrated, and stored after dehydration—by the method of Harris and Olliver⁵ and by the improved method of Mapson where correction

rate estimation of carotene and ascorbic acid in dehydrated vegetables.

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