

We are indebted to the Council of Scientific and Industrial Research for a grant.

T. S. GORE.
R. V. TALAVDEKAR.
K. VENKATARAMAN.

Dept. of Chemical Technology,
The University,
Bombay,
December 7, 1949.

1. Cartwright, Robertson and Whalley, *J. Chem. Soc.*, 1949, 1563. 2. Warren, Dougherty and Wallis, *J. Amer. Chem. Soc.*, 1949, 71, 3422. 3. Gore, Panse and Venkataraman, *Proc. Ind. Acad. Sci.*, 1949, 29A, 289. 4. —, *Nature*, 1946, 157, 333. 5. *Phil. Trans. Roy. Soc.*, 1931, 220B, 297. 6. Cf. Oxford, *Ann. Rev. Biochem.*, 1945, 14, 749; Mayer and Cook, *The Natural Organic Colouring Matters*, Reinhold, 1943.

GROWTH-PROMOTING FACTORS IN CORN GERM EXTRACT

THE potentiality of the corn germ extract for promoting growth of immature corn embryos in the culture medium is examined in this report.

Corn germ extract was compared against coconut water in their effects on embryo growth in corn since the latter was found to exercise some growth-promoting effect on a young corn embryo in a previous investigation of the author (²Uttaman, 1949). From this it also became clear that the embryo growth would perhaps be more clearly manifested if the extract was applied at the germinal stage. Bearing this in mind, in the present experiment the following treatments were laid out:

1. Aqueous extract of corn germ applied to Tukey's general purpose medium on the next day of placing the embryo in the medium.
2. Coconut water applied to the above medium on the next day of placing the embryo in the medium.
3. Control-Corn embryos placed in Tukey's general purpose medium without application of corn germ extract or coconut water.

Nine embryos of corn, each two-week-old were used in this experiment. The usual anti-septic precautions were adopted in the preparation of the extract of the germs ex-

cised out of the sprouting corn seeds. The extract was in the end Seitz-filtered under vacuum pressure as a measure against bacterial contaminations since the natural extracts are not usually stable to autoclaving. They were kept in one ounce bottles containing Tukey's general purpose medium (¹Uttaman, 1949) to which no physiologically active substances were added. The bottles were kept inside an incubator at $31^{\circ} \pm 1^{\circ}$ C. with one embryo in each, holding equal amount of the medium. Each treatment was thus repeated three times. Growth measurements for shoot and root were made contiguously for five days for the same embryo. The embryos were placed in the medium on September 12, 1947 and the extracts applied daily beginning on the next day. The results are entered in the table below:

Replication	Days of measurement	Extract of corn germ applied on 13-9-47		Coconut water applied on 13-9-47		Control	
		Shoot mm.	Root mm.	Shoot mm.	Root mm.	Shoot mm.	Root mm.
I	1st day	3.7	1.7	1.7	Nil	3.6	Nil
	2nd "	8.0	3.2	2.6	Nil	5.8	Nil
	3rd "	11.5	4.9	6.0	Nil	6.8	Nil
	4th "	18.1	4.9	6.0	Nil	7.2	Nil
	5th "	20.0	4.9	6.0	Nil	7.9	Nil
II	1st "	1.2	Nil	2.2	Nil	2.1	Nil
	2nd "	2.6	Nil	3.5	Nil	3.8	Nil
	3rd "	3.3	Nil	5.6	Nil	4.4	Nil
	4th "	4.5	Nil	5.6	Nil	4.8	Nil
	5th "	5.4	Nil	5.6	Nil	5.5	Nil
III	1st "	2.8	Nil	1.9	Nil	2.7	Nil
	2nd "	3.9	Nil	2.9	Nil	2.9	Nil
	3rd "	5.3	Nil	4.3	Nil	3.7	Nil
	4th "	7.9	0.2	4.3	Nil	4.5	Nil
	5th "	8.2	0.5	4.3	Nil	4.7	Nil

From the table it will be seen that the effect of the corn germ extract on the growth of the embryo is more marked than that of the coconut water and is of a more progressive character. This is particularly noticeable in the case of the second replication. In spite of the fact that the initial size of the shoot in this was only 1.2 mm., being only half as long as that treated with coconut water in the second replication, it was able to make up this difference in size within a short period of four days. The depressing effect of the coconut water is also very noticeable. The results confirm