

hormone administration and after bloodletting, some time is needed to activate protein synthesis, to synthesize the hyperpolarizing factor, while in case with the homogenate the effect is produced by the 'already available' hyperpolarizing factor. While further investigation is necessary here, it can be assumed, that the hyperpolarizing factor is a peptide. It can be also assumed that, by affecting the state of membrane, the discovered factor adapts the cell metabolism and function to the conditions of intensive protein biosynthesis.

Allelopathy in spring wheat mixtures¹

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Summary. In a study with binary mixtures of 3 spring wheat cultivars harmful effects due to allelopathy were observed on root number, root growth and fresh weight of the seedlings.

Allelopathy is generally described as any direct or indirect harmful effect of one plant on another through the production of certain chemical compounds^{2,3}, although beneficial allelopathic effects through the release of growth hormones have been reported⁴. Roy⁵, working with rice mixtures under field conditions, observed that yields from mixtures were higher than the means of the yields from pure stands due to the beneficial effects of allelopathy. In our studies⁶⁻⁸ with mixtures of spring wheat cultivars under field conditions the mixtures gave a higher yield than the highest yielding cultivar only under adverse weather conditions⁷ or under high fertility⁶. The present investigation was therefore taken up to find out whether allelopathy was present in spring wheat mixtures.

Materials and methods. The study was conducted with 3 spring wheat cultivars and their 1:1 binary mixtures. The 3 wheat cultivars differed in plant height and maturity duration. C 306 is a tall cultivar with medium late maturity (155 days), HD 2160 is a dwarf cultivar with early maturity (140 days) and Kalyan Sona is a semi-dwarf cultivar with medium early maturity (150 days). 40 seeds in 4 rows of 10 seeds each were placed in white enamel trays (38×30×6 cm). The inter and intra row spacings were 10 and 2.5 cm. In the pure stands all the 40 seeds were of a

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single cultivar, while in mixtures 20 seeds of each component cultivar were arranged in alternate rows. The trays were watered regularly and kept in an incubator at 30 ± 1 °C for 12 days. The data on root number, root length and fresh weight of seedlings were recorded. All treatments were replicated twice.

Results and discussion. Marked differences between the pure and mixed stands were observed 12 days after sowing (table). The root length, number of roots and fresh weight of seedlings were markedly reduced in all the cultivars when grown in mixtures. As the available space was sufficient for the root growth and the only medium of contact was water, it is likely that the inhibition effect on the roots and fresh weight of seedlings in the mixtures was due to allelopathy. Studies are in progress to identify the chemicals responsible for the observed effects. To our knowledge, this is the first report on allelopathy in spring wheat mixtures, and our objective in publishing this is to initiate similar studies in other laboratories. Studies on allelopathy in crop plants could be important to plant breeders as well as agronomists. In mass selection, allelopathy may play an important role in selecting suitable genotypes. Similarly, allelopathy needs to be studied in mixed and inter-cropping system.

Root length, number of roots and fresh weight of seedlings as affected by pure and mixed stands of wheat cultivars

Treatments	Average root length (cm)			Number of roots (No/seedling)			Fresh weight (mg/seedling) 12 days
	3 days	4 days	12 days	3 days	4 days	12 days	
1. HD 2160 (HD)	0.69	1.65	13.10	2.4	2.8	4.7	204
2. Kalyan Sona (K)	0.30	0.75	10.00	0.8	2.7	4.2	179
3. C 306 (C)	0.63	1.14	11.93	0.7	2.2	3.2	191
4. 1:1 HD:K (HD)	0.64	1.69	6.28	2.7	3.0	4.0	116
(K)	0.38	0.80	4.50	0.8	2.3	3.0	95
5. 1:1 HD:C (HD)	0.54	1.50	6.15	2.5	3.0	4.3	141
(C)	0.52	1.42	6.43	1.5	1.9	2.5	82
6. 1:1 K:C (K)	0.24	0.74	6.70	0.8	1.9	3.4	152
(C)	0.58	1.31	8.70	1.1	2.5	3.0	156

- 1 We thank Director, I.A.R.I. for facilities and encouragement.
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