

An α -amylase inhibitor from wheat grain was first described in 1946 [1]. It was then established that it was heterogeneous and belonged among the low-molecular-weight proteins [2].

We have isolated preparations of α -amylase by Warchalewski's method [3] from the kernels of the seeds of varieties of wheat grown in the Experimental Demonstration Farm at the Kazakh Scientific-Research Institute of Agriculture (Alma-Ata Province) in 1978. The grain of the same varieties of wheat, after treatment with a 3% solution of hydrogen peroxide, was germinated in a thermostat at 27-28°C for 48 h. For each variety, 3 g of the shoots was homogenized with 9 ml of a 0.2% solution of calcium chloride, the suspension was allowed to infuse for 2 hours, and it was centrifuged at 12,000 rpm on a LKh-413 centrifuge (Hungary) for 15 min. The supernatant was kept at 70°C for 15 min (to destroy the β -amylase); it was then rapidly cooled and was centrifuged again at 12,000 rpm for 20 min.

The α -amylase activity in 0.1 ml of the supernatant was determined by the method of Smith and Roe [4] in the absence and in the presence of the α -amylase inhibitor of each variety. The degree of inhibition of the amylases was judged from the differences (Table 1).

Thus, the highest activity of the α -amylase inhibitor from wheat grain is manifested in relation to the corresponding α -amylase (from the same variety). In relation to the α -amylases of the other varieties, the activity of the inhibitor isolated from a given variety of wheat falls as far as the complete disappearance of the very effect of inhibition. This fact shows the extremely fine interaction of the enzyme (α -amylase) and its natural protein inhibitor.

Table 1. Activities of α -Amylase Inhibitors Isolated from the Grain of Various Varieties of Wheat in Relation to α -Amylases of Shoots from the Same Varieties and Foreign α -Amylases.

Amylases extracted from the shoots of the following varieties	Preparation of α -amylase inhibitor (% inhibition of the α -amylases) from the following varieties						
	Bogarnaya 56	Dneprovskaya 521	Alma-Atinskaya 31	Bezostaya 1	Kazakhstanskaya 3	Kazakhstanskaya 4	Kazakhstanskaya 126
Bogarnaya 56	16	0	11	7	12	0	0
Dneprovskaya 521	3	14	16	8	11	9	8
Alma-Atinskaya 31	0	7	23	14	9	0	11
Bezostaya 1	4	5	20	16	0	3	10
Kazakhstanskaya 3	13	5	11	3	20	12	6
Kazakhstanskaya 4	9	3	0	11	2	15	0
Kazakhstanskaya 126	14	5	11	4	10	13	21

LITERATURE CITED

1. E. Kneen and R. M. Sandstedt, Arch. Biochem., **9**, 235 (1946).
2. R. Deponte, R. Parlamenti, T. Petrucci, V. Silvano, and M. Tomasi, Cer. Chem., **53**, 805 (1976).
3. J. R. Warchalewski, Bull. Acad. Pol. Sci. Ser. Sci. Biol., **25**, 725 (1977).
4. B. W. Smith and J. H. Roe, J. Biol. Chem., **179**, 53 (1949).

V. R. Vil'yams Kazakh Scientific-Research Institute of Agriculture, Alma-Ata. Translated from Khimiya Prirodnykh Soedinenii, No. 5, p. 742, September-October, 1979. Original article submitted April 23, 1979.