Relative quantities of α-amylase (extracellular) produced by each strain of *A. niger* obtained by comparison with the standard curve

Fungal strain	Nutrient requirement	Volume of α-amylase enzyme corresponding to optical density from standard curve	Enzyme activity
551	none	0.625	16656.25
An (wild type)	none	0.07	1865.5
P4	none	0.41	10926.5
83	none	0.15	3997.5
32	none	0.07	1865.5
758	Arginine[a]	0.085	2265.25
111	Leucine[a]	0.19	5063.5
346	Methionine[a]	0.15	3997.5
862	Leucine[a]	0.11	2931.5
554	Methionine	0.06	1599.0
115	Methionine[a]	0.05	1332.5
16	Methionine[a]	0.05	1332.5
596	none	0.05	1332.5
E2	none	0.07	1865.5
E3	none	0.19	5063.5
E4	none	0.11	2931.5
P1	none	0.025	666.25
P3	none	0.015	399.75
56	none	0.03	799.5
57	none	0.01	266.5

[a] Tapioca flour liquid media supplemented with respective amino acids at a final concentration of 1 g/l.

In another series of experiments, a similar procedure was repeated with the introduction into the tapioca liquid medium of known volumes of pure, α-amylase in the place of the fungal culture. 4 replicates were used in each case. The Figure summarizes the results obtained in the form of a graph.

A comparison of the mean optical density readings for the strains for the first experiment and the values of the standard curve gives information on the respective relative quantities of α-amylase produced by each strain of *A. niger* (Table).

Mutant strains of *Aspergillus niger* used in the analysis were obtained from the wild type strain *An*, by mutagenic treatment. γ-ray irradiation of conidiospores of the wild type strain using a Co^{60} source to give a dose of 50 Kr was administered. This gave a survival of about 2%. Mutant strains that were obtained differed from the wild type in specific nutrient requirements, morphology and ability to utilize starch. High producing strain, 551, is a prototroph which conidiates freely. Strain P4 is another prototroph which conidiates freely. 4 auxotrophic mutants have improved amylase activity when compared with the wild type strain and 3 have a slightly lower level of enzyme activity. From the results, some of the strains with very low activity seemed to be prototrophic.

This turbidimetric method provides a convenient means for determining the starch utilization capability of strains of the fungus.

A simple system for inspection of microelectrophoretic patterns

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Summary. An inexpensive device for inspection of electrophoretic patterns on microgels is described. A common slide frame is modified in order to hold inside microgels immersed in liquid, so that the gels may then be projected on paper screens. The electrophoretic patterns may be drawn on the basis of the gel images. Staff-meeting presentation of microelectrophoretic patterns seems to be another application of the system.

Separation of macromolecules on acrylamide microgels with diameters down to 0.2 mm permits analysis on minute tissue samples down to single cells[2]. Such methods, like corresponding standard electrophoretic macromethods, also allow the determination of molecular parameters of the resolved bands by comparing their relative electrophoretic mobilities with those of suitable standards[3]. Thus, it is important to have an adequate means of determining the microelectrophoretic pattern.

In the sequence of analytical steps, the inspection and evaluation of the separated bands may cause trouble due to the small dimensions of and between the bands[4]. Densitometry may be performed directly on the gels, requiring in this particular case sophisticated instrumentation, or the gels may be photographed and subsequent inspection and analysis is made on the film. This introduces a time-consuming step and a loss of information. An alternative way involves the use of amicroscope, fitted with a drawing apparatus. We describe a simple and inexpensive method for visualization of electrophoretic patterns on microgels by projection of the stained gels on a screen.

A common slide frame is modified so that it can hold microgels completely immersed in liquid (figure 1). A rectangular rubber packing, thickness 1–2 mm, is positioned as in figure 1 and secured to the glass with glue. 2 rectangular pieces of glass, of a thickness slightly less than the rubber packing, are fastened to the glass of the frame, inside the rubber packing, so that a slit-shaped trough is produced, the width suitably being between 0.5 and 1 mm. The gel can be placed in the dry slit. If the gel tends to float when liquid is poured upon it, a cover-slip may be placed above the 'slit' with the gel, and by capillary force the trough will be filled with liquid, added to fill the space inside the rubber packing. The slide frame is then closed, resulting in a liquid-containing space inside the packing with the gel in the slit-trough. The frame is placed in any type of slide projector, and to allow only projection of the gel, the exterior of the frame is masked with razor blades to permit light to pass only through the slit-trough.

Projected on a suitable paper screen (figure 2), the electrophoretic pattern can be drawn on the basis of the gel image. It is then possible to determine the electrophoretic

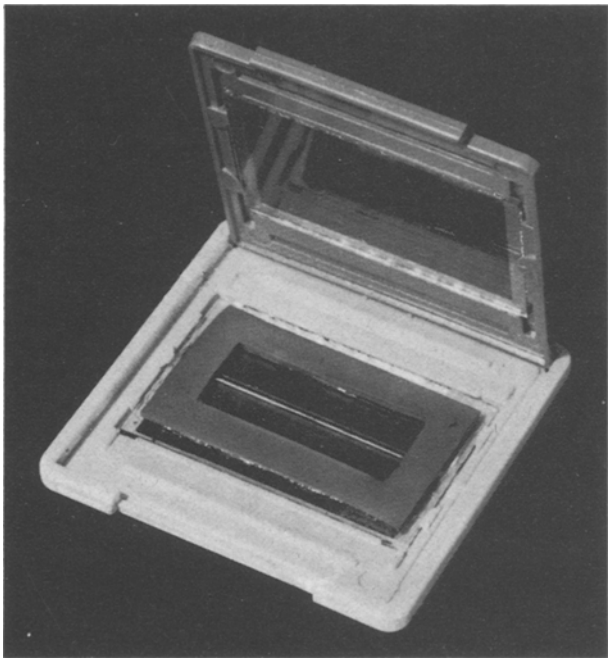

Fig. 1. Slide frame, modified for accomodating microgels, in open position ready for loading.

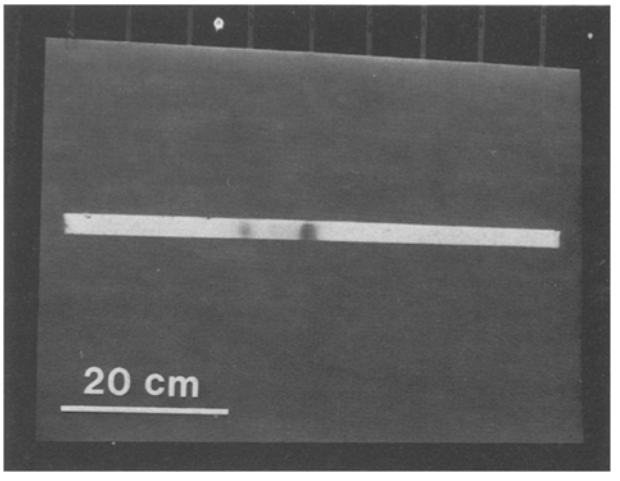

Fig. 2. Illustration of the projection of a gel with a diameter of 1.0 mm. The gel, 1.7% acrylamide + 0.7% agarose, was loaded with 0.20 µg of brain microsomal RNA and run 45′ at an average current of 200 µA[4].

mobilities of the resolved molecular species relative to a reference band. These data for RNA and SDS protein microelectrophoresis provide the possibility of determination of molecular parameters such as the molecular weight[2,3] and molecular radii[5].

If the migration distances of the reference band are not identical from gel to gel in a series of experiments, they can easily be standardized by varying the projector-screen distance or zooming the objective. Densitometry can also be made with the gel inside the frame and direct photocopying without losing information in a negative can also be performed. Further, in staff-meetings presentation of gels by this procedure seems ideal.

A modification making it feasible to accomodate several gels in one frame can be made by substituting several bars (25 mm × 1 mm × 1 mm) for the 2 rectangular pieces of glass, thus producing a number of slit-troughs. It seems to us that this system often sufficiently meets many demands, that it is versatile and is associated with a negligible expense.

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PRAEMIA

Prize 'Biochemical Analysis' 1978

The prize of DM 10,000.– is donated from Boehringer in Mannheim, and is awarded every two years at the conference 'Biochemische Analytik' in Munich for outstanding work in the field of biochemical instrumentation and analysis. The donation will take place between 18 and 21 April during the 1978 conference. One or several papers concerning one theme each, either published or accepted for publication between 1 October 1975 and 30 September 1977, may be sent to: Prof. Dr I. Trautschold, Secretary of 'Biochemical Analysis', Medizinische Hochschule Hannover, Karl-Wiechert-Allee 9, D–3000 Hannover 61, Federal Republic of Germany.