Comments and Communications

Glycine Reagent for Paper Chromatograms

Glycine on a paper chromatogram can be identified as a Hellebore green spot, chocolate brown under radiation in the region of 3650 A, by spraying with a solution of ortho-phthalaldehyde, previously described by the senior author as a colorimetric reagent (A. R. Patton, *J. biol. Chem.*, 1935, **108**, 267). Interfering substances present in protein hydrolyzates (particularly ammonium ions) are dispersed by using 77% ethanol as the solvent mixture. (Aromatic solvent mixtures produce abnormal reactions. We have found ethanol to be satisfactory for ascending separation in a range between 65 and 85% by volume, and 77% ethanol $\left[\text{sp. gr. } 0.87 \frac{60^\circ \text{ F}}{60^\circ \text{ F}}\right]$ the most suitable.) Rf values for individual amino acids with ascending irrigation on Whatman No. 1 paper were measured with ninhydrin as follows: cystine 0, lysine .21, arginine .26, aspartic acid .28, histidine .29, glycine .32, serine .37, tryptophan .38, glutamic acid .39, tyrosine and hydroxyproline .43, threonine .45, alanine .49, proline .55, methionine .64, phenylalanine .65, valine .68, leucine .76, isoleucine .77, and ammonium ions .57 (developed with glycine reagent).

In addition to identifying glycine, use of the reagent permits detection of ammonium ions (dark grey), and histidine and tryptophan (separate spots, intense yellow fluorescence under radiation around 3650 A). Among the compounds tested which cannot be detected by use of the glycine reagent are alanine, arginine, asparagine, aspartic acid, choline, creatinine, cystine, glutamic acid, glutamine, glutathione, glycine-betaine, hydroxyproline, isoleucine, leucine, lysine, methionine, nor-leucine, phenylalanine, proline, serine, threonine, tyrosine, and valine.

The method has been found satisfactory for the detection of glycine in the hydrolyzates of casein (low in glycine), gelatine (high in glycine), pilchard protein, Vegamine (a hydrolyzed plant protein), as well as in a mixture of 18 amino acids. Out of three commercial samples of hydroxyproline tested, one was found by this method to be contaminated with glycine.

The glycine reagent is apparently not yet available on the market. For the sample used we are indebted to Charles D. Hurd, Northwestern University. This sample was prepared as follows: 10 g o-bis(dibromomethyl) benzene was hydrolyzed according to the directions of Patton (*J. biol. Chem.*, 1935, **108**, 267) with 9 g potassium oxalate, 62 ml each of water and 95% ethanol. The mixture was refluxed 41 hr with occasional shaking, after which 50 ml was distilled off, and added to 300 ml water containing 21.3 g trisodium phosphate dodecahydrate. The solution used as "glycine reagent" was obtained by distilling 300 ml from this mixture, melting out crystals as they appeared in the condenser. The colorless solution, stored in a brown bottle, was over 18 months old when used.

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Nomenclature of the Soybean

In the paper published recently by P. L. Ricker and W. J. Morse (*J. Amer. Soc. Agron.*, 1948, **40**, 190), the old question of the correct scientific name for the soybean was discussed again. According to the authors' point of view, *Glycine Max* (L.) is the name to be used for that plant. The authors base their arguments on the apparent fact that *Phaseolus Max* L. is the oldest specific name for the soybean. I wish to show later the status of this name. There is no doubt that Linnaeus' original description of *Phaseolus Max* in his *Species plantarum* (1753) has some specific characters derived from another element, namely *Phaseolus Mungo* L.; this may be proven by the reference to a name under *P. Max*, which was given to the plant, now being known under the name of *Phaseolus Mungo* L., by P. Herrmann in *Musaeum Zeylanicum* (1726). The majority of the botanists interested[1] consider *Phaseolus Max* L. to be identical with *Phaseolus Mungo* L. Furthermore, H. Trimen[2] proposed entirely to use the name of *P. Max* L. in favor of that of *P. Mungo* L.

Generally, the confused species *Phaseolus Max* L. would belong partially to the genus *Glycine*, partially to that of *Phaseolus*. On the other hand, the proper description of the soybean was made by Linnaeus under the name of *Dolichos Soja*, also in his *Species plantarum* (1753). On account of the above remarks it is evident that *Phaseolus Max* of Linnaeus must be considered as a *nomen confusum*. (*Int. rules of botanical nomencl., Art. 64*: "A name of a taxonomic group must be rejected if the characters of that group were derived from two or more entirely discordant elements, especially if those elements were erroneously supposed to form part of the same individual.") Because of increasing use of the invalid name for the soybean,[3] *Glycine Max* (L.) Merrill, instead of the correct denomination *Glycine Soja* (L.) Siebold et Zuccarini, I hope this note may be useful.

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[1] Represented by W. Roxburgh (*Flora indica*, 1832).

[2] *Handbook of the flora of Ceylon*, 1894, **2**, 72.

[3] Quite recently, the incorrect name *Glycine Max* has appeared also in a number of standard handbooks, e.g. C. D. Darlington & E. K. Janaki Ammal: *Chromosome atlas* (1945).