

A Note on Dissimilar Subunits Present in Dissociated Soybean Globulins

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It has been previously shown that four major immunochemically different globulins are present in the reserve protein fraction of soybean seeds (1). These proteins have been isolated (1,2) and called glycinin and alpha-, beta-, and gamma-conglycinins (1,3). Recent studies (4) have demonstrated that glycinin subjected to different experimental conditions does not dissociate or associate into components immunochemically different than the parent molecule. This was interpreted as supporting evidence that the isolated conglycinins are individual proteins and not breakdown products of glycinin.

In support of the immunochemical findings are the results reported in the current study on the dissimilar subunit composition of the dissociated globulins. Glycinin and the conglycinins were isolated by methods described previously (1,2). The globulins were dissociated into subunits in the solvent system phenol-acetic

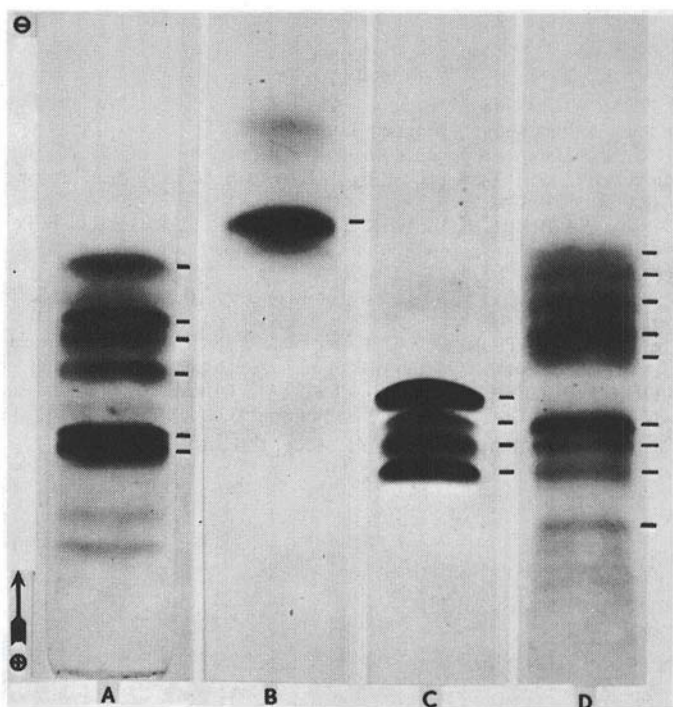


Fig. 1. Disc electrophoresis of the major reserve proteins of soybean seeds after dissociation in the solvent system phenol-acetic acid-0.2M mercaptoethanol (2:1:1, w./v./v.) made 5M in urea. The polyacrylamide gels were equilibrated with the same solvent (ref. 5). Key: A, glycinin; B, alpha-conglycinin; C, beta-conglycinin; and D, gamma-conglycinin.

acid-0.2M mercaptoethanol (2:1:1, w./v./v.) made 5M in urea (4,5) and subjected to disc electrophoresis on polyacrylamide gels equilibrated with the same solvent (5). Glycinin and each of the conglycinins exhibit different number and pattern of subunits by disc electrophoresis (Fig. 1). Alpha-conglycinin appears to be composed of one subunit. Glycinin, and beta- and gamma-conglycinins have a multi-subunit structure. Thus, glycinin appears to be composed of six subunits, beta-conglycinin of four, and gamma-conglycinin of nine subunits. Only the major bands seen in the gel patterns have been taken into consideration in determining the number of subunits. The minor bands (since each one represents 2 to 3% of the densitometer tracings only) may be either contaminants or minor association products of the subunits.

At present, it is not known if the bands seen in Fig. 1 represent single-chain subunits. However, this possibility is favored by the experimental conditions and N-terminal amino acid analysis data. According to the latter, and considering the possible identity (1,3) of the presently described globulins with previously isolated soybean globulins, glycinin contains six different subunits (4), alpha-conglycinin contains one subunit(6), and gamma-conglycinin contains nine subunits (7).

The dissimilarity of the subunits of soybean globulins apparently contributes to the complexity involved in the fractionation and characterization of these components especially under conditions favoring association-dissociation phenomena.

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