**Common bean proteins: similar interfacial rheology, distinct interfacial structures and functionalities**

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In the current protein transition, plant proteins have been extensively studied; however, their compositions are typically complex, and the direct relationships between composition, structure, and functional properties remain unclear. To investigate the impact of compositional and structural differences on plant protein properties, we focused on common bean (Phaseolus vulgaris L.), the most widely consumed legume worldwide. Proteins were extracted from three commercially available common bean varieties—red kidney bean, black turtle bean, and pinto bean. Proteomics analysis revealed that the primary component in all three varieties was a 7S globulin, phaseolin, and extracts had nearly identical protein compositions. Interfacial rheology at the air-water interface demonstrated no significant differences in adsorption kinetics or dilatational moduli among the three proteins, indicating the formation of solid-like interfaces with similar stiffness. However, Langmuir-Blodgett deposition combined with AFM revealed that all three proteins formed a unique strand-like structure at the interface, though different surface pressures or aging times were required to achieve these structures. More surprisingly, foam stability also showed significant variation, with the foam half-life time of black turtle bean globulin reaching 25.3 hours, over 3.7 times that of the other two proteins. These findings suggest potential structural differences among the protein extracts despite their nearly identical composition, which are insufficient to cause differences in interfacial rheology but can influence the formation of interfacial structures and foamability. This study provides new insights into the link between protein structure and interfacial properties, contributing to the understanding of plant protein functionality.