**Starch-Mineral Ion Complexes: Toward developing Novel Edible Films**

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Essential minerals are crucial inorganic micronutrients that modulate vital physiological functions at the molecular level. Their deficiency, though required in small amounts, impairs health significantly. Their supplementation through diet is prudent, and carbohydrates stand out as a favorable choice. Carbohydrates - starches and polysaccharides - exhibit unique chemical structures and functionalities and interact with mineral ions in several ways. Herein, corn starch and potato starch have been complexed with mineral ions Fe2+, Mn2+, Cu2+, and Zn2+, and edible films prepared by mixing 1.4% (w/v) of starch, 0.1% (w/v) starch-mineral complex, 0.5% (w/v) sodium alginate and 1% (v/v) glycerol. The physicochemical properties, tensile strength, and in vitro starch digestion of films have been studied. The maximum mineral loading is found to be 56.5, 68.5, 44.0, and 15.7 mg of Fe2+, Mn2+, Cu2+, and Zn2+ ions per gram of starch. The films are transparent, thin, flexible, and homogeneous. The presence of Mn2+ and Fe2+ ions bestows a brownish-to-yellowish tint leading to higher color difference and yellowness index and, in turn, lower film transparency. The water solubility and moisture absorption increase substantially compared to the control starch films. The potato starch films possess higher water vapor permeability of 1.8 x10-10 gm-1s-1Pa-1 and tensile strength of 7.76 MPa and rise with mineral ions addition. The starch digestion of films increases with the presence of mineral ions. The outcome sets the stage for designing and developing mineral-carbohydrate complexes for novel functional foods and edible films, mitigating micronutrient malnutrition and improving nutritious living.