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Physicochemical Characterization of Raft-Forming Delivery Systems for Curcumin Formulated Using Polysaccharide Hydrogels

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***SUMMARY*. Raft-forming delivery systems incorporating curcumin solid dispersions were prepared based on hydrogels of alginate or pectin. The solid dispersion using a 10:1 ratio of polyvinylpyrrolidone K-30 to curcumin improved the solubility of the active. The raft-forming formulations were composed of a polysaccharide gelling polymer in combination with HPMC K4M as an addition polymer. All formulations formed a floating raft within 1 min of exposure to simulated gastric fluid (pH 1.2) and maintained buoyancy for more than 8 h. Raft formulations incorporated HPMC K4M provided more gradual and sustained release of up to 80 % of the curcumin load over a period of 8 h. Raft formulations based on either 1% w/v sodium alginate solution (low viscosity grade) 1% w/v sodium alginate solution (medium viscosity grade) or 2% w/v pectin solution incorporating 0.5% w/v HPMC K4M exhibited an acceptable viscosity, raft strength and resulted in release of 60-80% of the curcumin.**

RESUMEN. Se prepararon sistemas de liberación formadores de balsa que incorporan dispersiones sólidas de curcumina basadas en hidrogeles de alginato o pectina. La dispersión sólida usando una relación 10:1 de polivinilpirrolidona K-30 a curcumina mejoró la solubilidad del activo. Las formulaciones formadoras de balsa estaban compuestas por un polímero gelificante de polisacáridos en combinación con HPMC K4M como polímero de adición. Todas las formulaciones formaron una balsa flotante dentro del min de exposición al fluido gástrico simulado (pH 1.2) y mantuvieron la flotabilidad por más de 8 h. Las formulaciones en balsas que incorporaron HPMC K4M proporcionaron una liberación más gradual y sostenida de hasta el 80% de la carga de curcumina durante un período de 8 h. Formulaciones de balsa basadas en solución de alginato de sodio al 1% p/v (grado de viscosidad bajo) solución de alginato de sodio al 1% p/v (grado de viscosidad medio) o solución de pectina al 2% p/v que incorpora HPMC K4M al 0,5% p/v exhibieron una aceptable viscosidad, resistencia de la balsa y dio como resultado la liberación del 60-80% de la curcumina.

KEY WORDS: alginate, curcumin, pectin, raft forming systems, solid dispersion.

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