UNIVERSITI TEKNOLOGI MARA

PECTIN FOR TRANSDERMAL DRUG DELIVERY SYSTEM : A HISTOLOGICAL ASSESSMENT

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TABLE OF CONTENTS

ABSTRACT

The effect of pectin as transdermal drug delivery system matrix on rat skin histology was investigated. Oleic acid (OA) was employed as a penetration enhancer. Four types of films and gels were prepared by dissolving the pectin powder with or without oleic acid in deionised water under continuous stirring at 25 ± 1 °C for 15 h. Rat skin applied with the films and gels were subsequently subjected to the staining method by Harris Haematoxylin-Eosin (H&E) andOil Red O (ORO) Stain Kit for histological examination. The application of pectin on rat skin did not induce skin damage as shown by the cross-sectional histology of skin stained by H&E and ORO. No significant amount of oleic acid permeated through the skin from pectin film or gel when compared to the skin applied with OA–free film or gel. The pectin molecules could act as a binding agent for epidermis and dermis, hence creating and impermeable skin barrier for permeation of oleic acid. Further study is needed in order to explore the use of pectin as a matrix polymer for transdermal drug delivery system.

CHAPTER 1

INTRODUCTION

1.1 Research background

Pectin can be defined as the galacturonic acid-rich polysaccharides which consist of three major pectin polysaccharides which are homogalacturonan, rhamnogalacturonan-I and rhamnogalacturonan-II. Pectin act as one of major component of primary cell walls of all terrestrial plant which is the plant that growth on land. Pectin matrix contain high degree of structural complexity and heterogeneity because it is synthesized in its endomembrane system that come from the action of wall-based pectin-modifying enzymes (Willats, McCartney, Mackie, & Knox, 2001). On the other hand, pectin also may defined as naturally heteropolysaccharide that located in cell wall of most plant especially land plants and it is non toxically consist of linear α-(1-4)-d-galacturonic acid that been esterified with methanol (Ghaffari, Navaee, Oskoui, Bayati, & Rafiee-Tehrani, 2007).

The main use for pectin is as a gelling agent, texturizer, emulsifier, thickening agent and stabilizer in food by giving the jelly-like form consistency to jams(Mesbahi, Jamalian, & Farahnaky, 2005). Rather than plant as a major sources of pectin, it also can be found in citrus fruit peels (25% of dry matter) and dried apple pomace (15–18% of