

Review of Biomass Utilization for Hard Capsule: A Development of Plant Based Bio composite Films as Halal Material for Future Hard Capsule

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Abstract. Hard capsule is a versatile oral drug delivery, which is mainly from gelatin . Gelatin can be porcine or bovine source and produced from the extraction of animal collagen, both skin, bone, and connective tissue. The rise of pharmaceutical products derived from porcine is a big problem for a Muslim because of its status as the non-halal product. Many development works with new innovation process have conducted to replace of the gelatin- based hard capsule with plant-based hard capsule to resolve this issue. Exploration of new plant material with strong cellulosic fiber from different plant materials such as carrageenan and alginate which is a polysaccharide extracted from seaweeds; bagasse which converted into Nano Crystalline Cellulose (NCC) and glucomannan which extracted from several kinds of root crops. The advantages of hard capsule from plant are rapid drug released possible, flexibility formulated and halal. The developed material from plant materials is a potential prospect to overcome the drawbacks of gelatin which can be used as a halal drug delivery application and has the potential to be developed for future hard capsule.

Keyword: hard capsule, bio composite film; plant material; halal