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Preparation of controlled release nanocapsule for mosquito repellent application

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Mosquito repellents can help to protect against mosquitoes which transmit many disease such as Zika, malaria, dengue and other viral diseases [1,2]. Recently, people have used the products which made of both chemical and natural mosquito repellent agents [3]. However, the fast evaporation of active ingredients in mosquito repellents limits the time protection against mosquitoes [3,4]. To prolong the release time of mosquito repellent agent, the encapsulation technique can be applied. In this study, polymeric nanocapsules containing mosquito repellent agents, i.e. N,N-diethyl-m-toluamide (DEET) and eucalyptus oil were prepared by oil-in-water precipitation method. The hydrodynamic diameter and particle size distribution of prepared nanocapsules were characterized using dynamic light scattering method (DLS). Protection time against mosquito bites was investigated at various storage time. Moreover, the primary skin irritation of the nanocapsules were studied in using rabbit model. DEET-based mosquito repellent and eucalyptus oil-based mosquito repellent nanocapsules provided up to 12 hours and 3 hours of protection against mosquitoes, respectively. The polymer encapsulation is one effective approach to reduce the risk of mosquito bite and consequently prevent from many mosquito-borne diseases.

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