

PRODUCTION, CHARACTERIZATION AND EFFICACY OF ETHYL CELLULOSE-BASED NANOCAPSULES CONTAINING IMIDACLOPRID FOR CONTROL OF *MICROCEROTERMES DIVERSUS* (SILVESTRI) (ISOPTERA: TERMITIDAE) UNDER LABORATORY CONDITIONS

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Abstract *Microcerotermes diversus* (Silvestri) (Isoptera: Termitidae) is a major species of termites that attacks cellulosic materials and is an economically important pest, damaging buildings in Khuzestan Province (Iran). Neonicotinoids, most notably imidacloprid, have recently been introduced for pest control programs. The main purpose of this study was to develop new techniques for termite control by environmentally friendly formulations. Nanotechnology has become important in a number of fields during the past decade. The use of this new technology in the preparation of nanocapsules made of different materials in a slow and controlled release of drugs and toxins and increase stability within the nanocapsules has been recently reviewed. In the present study, we report for the first time the emulsification synthesis of ethylcellulose-based nanocapsules containing imidacloprid. In this method, we prepared the polymer and the polymer solution (including: ethylcellulose, imidacloprid, benzene and ethanol) was added drop by drop to an aqueous solution (including: deionized water, nitric acid, sodium dodecyl sulphate and polyethylen glycol). Finally, produced ethylcellulose-based nanocapsules containing imidacloprid and determined some of the quantitative and qualitative characteristics such as shape and size of the particles by Scanning Electron Microscope (SEM) using a secondary electron detector (SE) and Infrared spectroscopy (IR). The effects of ethylcellulose-based nanocapsules without imidacloprid and those containing 50, 100, 500 or 1000 ppm imidacloprid were evaluated against *M. diversus*. The ethyl cellulose in this formulation did not induce lethal effects against the termite and showed feeding attractancy. Treated filter papers with this formulation caused a gradual increase in mortality during the 14-day trial. Our results suggest that ethyl cellulose-based nanocapsules containing imidacloprid could be an effective termiticide formulation.