



**Zagazig University
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**SYNTHESIS AND EVALUATION OF SOME
HETEROCYCLIC COMPOUNDS AS LAND SNAIL
CONTROL AGENTS**

BY

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Abstract

Land snails are one of the most destructive agricultural pests causing economic damage on agricultural and horticultural crops. In recent years, in Egypt, two species of land snails; *Eobania vermiculata* and *Monacha cartusiana* have been increasing rapidly and infected the majority of field crops and causing heavy damage. 2-Hydroxyliminouridine derivatives **14** & **15** were synthesized by glycosylation of silylated 2-thiouracil with 1-*O*-acetyl-2,3,5-tri-*O*-benzoyl-D-ribose under Vorbruggen glycosylation conditions to furnish 2,3,5-tri-*O*-benzoyl-2-thiouridine. Alkylation of the later compound should furnish 2-methylthiouridine which was reacted with hydroxylamine hydrochloride in dry pyridine then deprotected under conventional condition to give 2-hydroxyliminouridine. The later compound treated with TBDMSCl then Lawesson's reagent followed by TBAF to furnish 2-Hydroxylimino-4-thiouridine. Stereochemistry of 2-hydroxyliminouridine derivatives **14** & **15** were studied using DFT. A series of 4-substituted pyrazolones were synthesized. Pyrazolone (**8**) was chlorinated and brominated to the corresponding 4-dichloro and dibromopyrazolones derivatives (**9**), and (**10**). Nitroization of **8** afforded the 4-hydroxylimino derivative **11**. Reaction of **8** with the diazonium salt generated from 4-nitroaniline provided the diazo derivative **12**. The structures of synthesized compounds were determined by ¹H-NMR, ¹³C-NMR, UV and IR spectroscopy. Four concentrations (1, 1.5, 2, and 2.5%) of compounds (**8**, A), (**9**, B), (**10**, C), (**11**, D), and (**12**, E) were evaluated against adults of two land snails species; *Eobania vermiculata* and *Monacha cartusiana* under laboratory conditions. Compound B exhibited the highest toxic effect against *E. vermiculata* followed by compound E, compound D, and compound C, respectively. While the parent compound (A) had no effect at all. Compound B showed the highest toxic effect against *M. cartusiana* followed by compound C, compound E, and

compound D, respectively. While the parent compound (A) showed the least activity. The LC₅₀ and LC₉₀ values for compounds B, E, D, and C against *E. vermiculata* were determined. Compound B (LC₅₀ 11.26 g/L, LC₉₀ 24.54 g/L), compounds E (LC₅₀ 11.60 g/L, LC₉₀ 24.27 g/L), compound D (LC₅₀ 12.38 g/L, LC₉₀ 23.56 g/L), and compound C (LC₅₀ 27.14 g/L, LC₉₀ 132.00 g/L). The LC₅₀ and LC₉₀ values of compounds B, C, E, and D against *M. cartusiana* were determined, compound B (LC₅₀ 4.41 g/L, LC₉₀ 13.58 g/L), compound C (LC₅₀ 6.71 g/L, LC₉₀ 17.46 g/L), compounds E (LC₅₀ 8.76 g/L, LC₉₀ 18.48 g/L), and compound D (LC₅₀ 10.60 g/L, LC₉₀ 19.25). The LC₅₀ values of compounds **10-12** were evaluated against *Monacha species* under field conditions.

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