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Letter

Reply to "one-pot synthesis of the sex pheromone homologs of a codling moth, *Laspeyresia promonella* L."

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1. Introduction

Nagaki et al. [1] provided what they called "one-pot synthesis of the sex pheromone homologs of the codling moth, *Laspeyresia promonella* L". In this paper [1], they have considered (2*Z*,6*Z*)-7-methyl-3-propyldeca-2,6-dien-1-ol as the natural sex pheromone of codling moth, and they provided what they called a one step synthesis of the homologs of this compound instead of four steps that have been previously described by Cooke [2,3]. Their work was based on three published articles in the early 1970s, where McDonough et al. [4], and Cooke [2,3], claimed that they isolated and chemically identified the sex pheromone of codling moth. Although their effort to simplifying the synthesis procedures of the sex pheromone homologs of codling moth is appreciated, I would like to stress that the compounds they have considered to be the natural sex pheromone of codling moth or its homologs have no relation to the codling moth sex pheromone.

Codling moth is considered one of the most serious pests of pome and stone fruits worldwide. By giving a rebirth to wrong information on the codling moth sex pheromone that was already buried 28 years ago could lead to unpredictable damage, especially in the industry sector where the sex pheromone of codling moth is produced in mass and they rely on the literature as a main source for updating their synthesis procedures. Therefore, it is useful to provide a quick overview on the sex pheromone of codling moth.

2. Sex pheromone of codling moth

In their pioneering experiments in 1971, Roelofs et al. [5] have identified (*E*)-8,(*E*)-10-dodecadien-1-ol (Fig. 1), as the sex pheromone component of codling moth based on electroantennogram recordings of model compounds, GLC retention times of EAG activity of natural pheromone compared to standards, GLC retention times of natural pheromone compared to synthetic isomers of proposed pheromone, and biological activity in the field with synthetic pheromone. Two years later, McDonough et al. [4] questioned Roelofs et al. [5] identification, and claimed that they had isolated and chemically identified (2*Z*,6*E*)-7-methyl-3-propyldeca-2,6-dien-1-ol to as the sex pheromone of codling moth. In 1973, Cooke [2,3] proposed that the compound that has been reported by McDonough et al. [4] is incorrect with regards to the steriochemical details, and he claimed that (2*Z*,6*Z*)-7-methyl-3-propyldeca-2,6-dien-1-ol is

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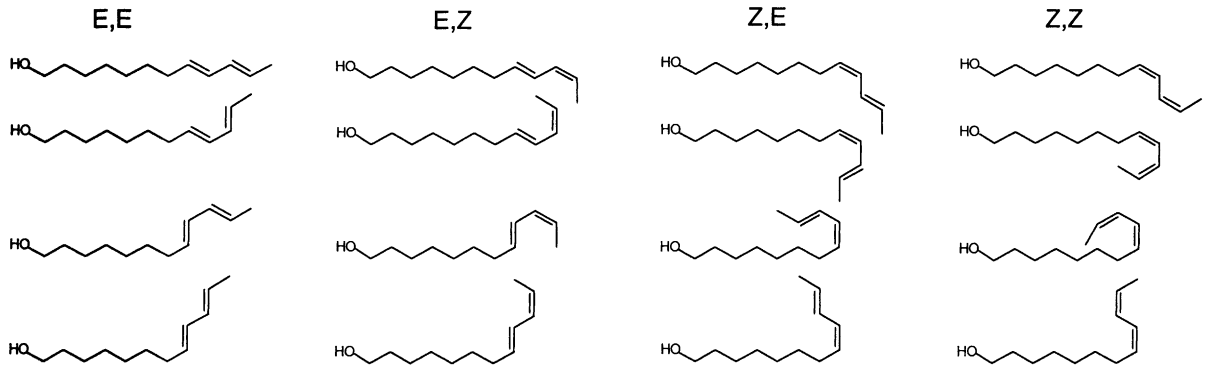

Fig. 1. (*E*)-8,(*E*)-10-dodecadien-1-ol molecule, the correct sex pheromone of codling moth and its three geometrical isomers (*E*,*Z*), (*Z*,*E*) and (*Z*,*Z*) in all possible conformations [15].

the correct configuration for codling moth sex pheromone. At this point, the story of the chemical identification of the codling moth sex pheromone was not considered further by Nagaki et al. [1]. However, in 1974, Beroza et al. [6] were able to isolate and chemically identify (*E*)-8,(*E*)-10-dodecadien-1-ol in the sex pheromone gland of codling moth, thus confirming Roelofs et al. [5]. In the same issue of the Journal Science, McDonough and Moffitt [7] had acknowledged that the compound they had previously reported to be the sex pheromone of codling moth is false and biologically unattractive. In the subsequent years, scientists around the world have confirmed that (*E*)-8,(*E*)-10-dodecadien-1-ol is the sex pheromone of codling moth (e.g. [8,9]). Nowadays, (*E*)-8,(*E*)-10-dodecadien-1-ol plus additional minor compounds that have been identified later in the sex pheromone gland [10,11] are being used for monitoring and providing an environmentally friendly control method for codling moth. The initial incorrect identifications of the sex pheromone of codling moth may have occurred for several reasons, and there is no need to discuss it here. However, it is unfortunate that after 28 years, a report is published that is based on such an old and incorrect identification.

3. Geometrical isomers of the sex pheromone of codling moth

The compound (*E*)-8,(*E*)-10-dodecadien-1-ol is known to isomerize on all available dispenser materials (Fig. 1) [12]. The process of synthesis of the three closest geometrical isomers (*E*,*Z*), (*Z*,*E*) and (*Z*)-8,(*Z*)-10-dodecadien-1-ol has been described [13] and it was based on the synthesis of acetate analogs [14]. At least two of these geometrical isomers enhance the environmentally friendly control method of codling moth when added to (*E*)-8,(*E*)-10-dodecadien-1-ol. However, the syntheses of these geometrical isomers are tedious and time consuming. Therefore, any effort to simplifying the synthesis process of these isomers will be appreciated and scientifically justified.

I hope that this quick overview and correction of the error regarding the sex pheromone of codling moth will allow Nagaki et al. to really provide one-pot synthesis for the sex pheromone homologs of codling moth. Once they have achieved this, and they are in the process of writing their work, I hope that they spell out the scientific name of codling moth correctly, it should be spelled *Laspeyresia pomonella* instead of *Laspeyresia promonella* and actually the most recent name of codling moth is *Cydia pomonella*. For the present time, the title of their work should be changed to “one-pot synthesis of (2*Z*,6*Z*)-7-methyl-3-propyldeca-2,6-dien-1-ol”.

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