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Dihydrocinnamic acid esters as antioxidants

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Cinnamic acid derivatives, especially those containing free hydroxyl groups in cinnamoyl moiety, present strong free radical scavenging properties [1]. 4-Hydroxy-3,5-dimethoxycinnamic acid choline ester (sinapine) shows favorable biological properties, such as antioxidant and radio-protective activity [2]. 3,4-Dihydroxy-dihydrocinnamic acid amide is effective in lowering the level of plasma lipids and improves the antioxidant enzymatic system [3].

In this work, antiradical properties of dihydrocinnamic acid esters were studied. The target compounds **1** were obtained through cleavage of substituted Meldrum's acid **2** with aliphatic or aromatic alcohols in pyridine (Scheme 1). Propargyl dihydrocinnamate **1a** was used in 1,3-dipolar cycloaddition with azid to give 1,4-disubstituted 1,2,3-triazol **3** (Scheme 2).

The antiradical properties of the synthesized esters were characterized by 1,1-diphenyl-2-picrylhydrazyl (DPPH) and galvinoxyl (GO) tests. DPPH and GO inhibition was expressed as IC_{50} and antiradical activity values. Antiradical activity according to DPPH assay for compounds **1** and **3** is 2-fold (56-96%) than that of commercially widely used dibutylhydroxytoluene (38% [4]).

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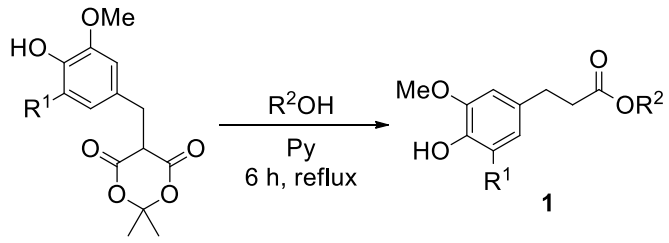
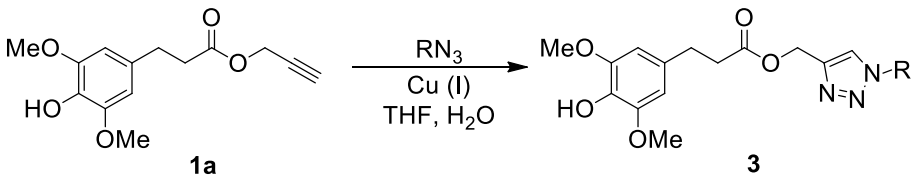


Scheme 1. Synthesis of dihydrocinnamic acid esters



Scheme 2. Synthesis of substituted 1,2,3-triazol