Synthesis of Quinoline-Triazoil Carboxylates by Organocatalytic Cycloaddition of β-Ketoesters and 4-Azido-7-Chloroquinoline

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INTRODUCTION

The importance of heterocyclic compounds is indisputable, especially the 1,2,3-triazoles, which have attracted much interest because they have a wide field of applications, ranging from use as explosives, even pesticides and as drugs.[1] However recent discoveries of methodologies for obtaining functionalized 1,2,3-triazoles, the interest on this class of compounds is increasing, and, among these methods of synthesis, there is the organocatalytic enamide–azide cycloaddition reaction.[2]

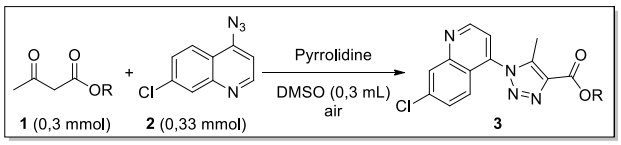
Similarly, another class of widely studied heterocycles are quinolines, which are characterized by containing in their structure a benzene ring fused to a pyridinic ring.[3] The interest in the synthesis of quinoline derivatives also has been increased for their know pharmacological properties.[4]

Because of the importance related to these two classes of heterocyclic compounds and due to potential biological applicability, we describe here or results on the synthesis of quinoline-triazoil carboxylates **3** through organocatalytic enamide-azide cycloaddition reaction between β-Ketoesters **1** and 4-Azido-7-Chloroquinoline **2**.

RESULTS AND DISCUSSION

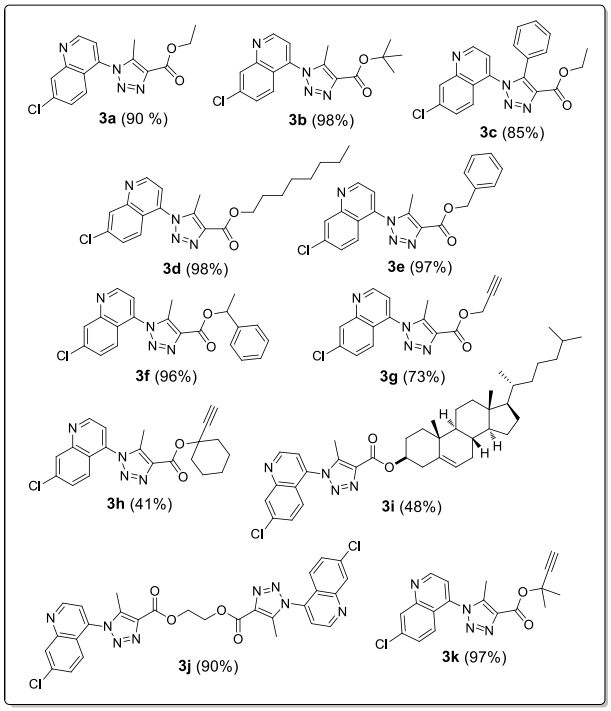
Initially, studies were conducted to determine the best reaction condition. For this, was reacted the ethylacetoacetate **1a** with 4-Azido-7-Chloroquinoline **2** and various organocatalysts, such as, pyrrolidine, piperidine, L-Proline, Et_2NH, Et_3N, using DMSO as solvent at different concentrations.

Figure 1. General scheme of the reaction.



After analyzing the results, we found that the desired product **3a** was obtained in better yield (90%), by reacting ethylacetoacetate **1a** (0.3 mmol) with 4-Azido-7-Chloroquinoline **2** (0.33 mmol) in presence of pyrrolidine as organocatalyst (10 mol%) and DMSO as solvent (0.3 mL) at room temperature for 24 hours in open flask. After that, under these optimized conditions, we realized some reactions varying the β-ketoesters **2a-k** and obtained a range of quinoline-triazoil carboxylates **3a-k** in high yields (Figure 2).

Figure 2. Quinoline-triazoil carboxylates **3a-k** synthesized.



CONCLUSION

In summary, we described the synthesis of molecules containing quinoline and 1,2,3-triazole heterocycles through organocatalytic enamide-azide cycloaddition reaction between β-ketoesters **1** and 4-azido-7-chloroquinoline **2**, using for this pyrrolidine as organocatalyst. The quinoline-triazoil carboxylates **3** were obtained in high yields under mild reaction conditions.

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