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Study on Synthesis of Heterocycle-Fused Troponoid Compounds

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Abstract: 3-Acetyltropolone **1** reacted with 3,4,5-trimethoxybenzaldehyde *et al*. to afford **2~5**. 2-Acetyl-7-methylaminotropone **7** reacted with 3,4,5-trimethoxybenzaldehyde *et al*. to gave **8~10**. Compound **1** reacted with 3,4,5-trimethoxybenzaldehyde in the presence of ethyl orthoformate and perchloric acid to afford **6**. Compounds **3**,**5** reacted with hydroxylamine to give **11**, **12**. The reactions of 3,5 with phenylhydrazine gave **13**, **14**.

Keywords: 3-Acetyltropolone, 2-acetyl-7-methylaminotropone, heterocycle-fused troponoid.

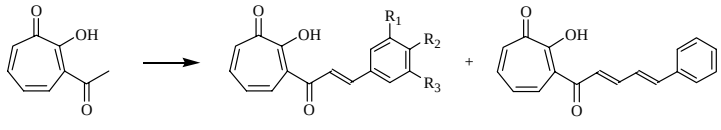
3,4,5-Trimethoxybenzaldehyde (TMB) is important intermediate for the synthesis of TMP and it is also the starting material of the synthesis of 3,4,5-trimethoxycinnamide, which was used as anticonvulsant medicine[1]. The tropolone nucleus is well known to be susceptible to many eletrophilic substitution reactions[2]. The reactions with nucleophilic reagents are also of interest, since chalcones reacted with hydroxylamine[3] and hydrazines[4] to give respectively diary-substitute isoxazolines and pyrazolines.

This paper deals with the reactions of 3-acetyltropolone and 2-acetyl-7-methyl-aminotropone with aromatic aldehydes such as TMB and the conversion of the products to styryl-substitted isoxazole- and pyrazole-fused tropones.

Results and Discussion

The acetyl group in tropolone can react with benzaldehydes to afford cinnamoyltropolones[5]. The condensation products **2~5** were obtained in good yields (50%~86%)**(Scheme 1)**.

Scheme 1

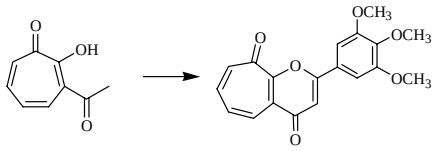


1 **2, 3, 4** **5**

R_1=R_2=R_3=OCH_3, R_1=R_3=OCH_3, R_2=OH, R_1=H, R_2,R_3=-OCH_2O-

The flavone-like heterocycle-fused troponoid compounds were obtained by oxidative cyclization of 3-cinnamoyltropolone[6]. 2-Hydroxyacetophenones were treated with benzaldehydes to afford flavones at one-step[7]. 3-acetyltropolone **1** and TMB in ethyl orthoformate was refluxed to give **6** in 46% yield **(Scheme 2)**.

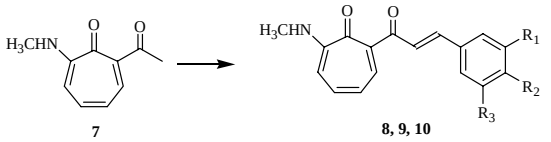
Scheme 2



1 **6**

A mixture of **7** and TMB *et al*. in methanol was added dropwise 5% potassium hydroxide, the precipitated crystals **8~10** were obtained **(Scheme 3)**.

Scheme 3

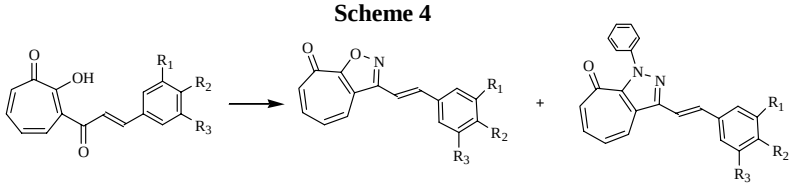


7 **8, 9, 10**

$R_1=R_2=R_3=OCH_3$, $R_1=R_3=OCH_3$, $R_2=OH$, $R_1=R_3=Br$, $R_2=OH$

3-Acetyltropolone reacted with various nucleophilic reagents to give a wide variety of heterocycle-fused troponoid compounds[8]. The reaction of compound **2**, **4** with hydroxylamine and phenylhydrazine gave **11~14 (Scheme 4)**.

Scheme 4



2, 4 **11, 12** **13, 14**

$R_1=R_2=R_3=OCH_3$, $R_1=H$, R_2,R_3=-OCH_2-

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References and Notes

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