ETHIOPIAN INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

eISSN: 2349-5715 pISSN: 2349-5707

Volume: 11, Issue 12, December-2024 SJIF 2019: 4.702 2020: 4.737 2021: 5.071 2022: 4.919 2023: 6.980 2024: 7,662

Alikulov R.V., Kholikova O.Y., Djumaev K.
Termez State University

SYNTHESIS OF A NEW AMINOCOLCHAMINE DERIVATIVE WITH DIMETHYLETHYNYLCARBINOL

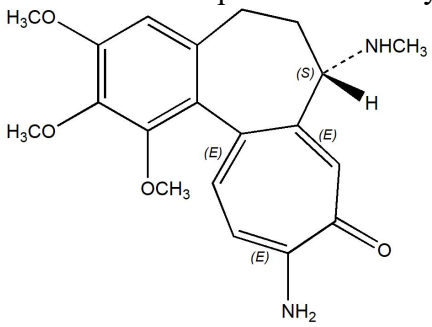
ABSTRACT: Synthesized 4-(colchamino N/1,1-dimethylbutin-2) carbinol. The structures of the synthesized compounds are confirmed by the data of IR and PMR spectra.
Keywords: Colchamine, dimethylethynylcarbinol, 4- (colchamino N / 1,1-dimethylbutin-2) carbinol.

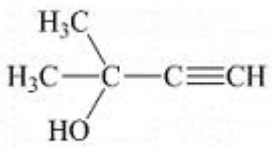
Aminoaminocolchamine is the second most widespread and abundant tropolone alkaloid in colchicine after colchicine. Aminoaminocolchamine differs from colchicine in its more pronounced basicity. This difference is used to separate them.

The structure and chemical transformations of the base were studied mainly by Kiselev and Shantavsky. Aminoaminocolchamine is 7-8 times less toxic than colchicine.

It is known that the introduction of groups containing an acetylene bond into the molecule of medicinal substances significantly reduces their toxicity. Since such work in the field of colchicine alkaloids has not been carried out previously, we synthesized derivatives of aminoaminocolchamine (1) with dimethylethynylcarbinol (2).

Initial compounds for the synthesis of acetylene derivatives of aminoaminocolchamine (1):





2.

The condensation reaction of aminoaminocolchamine with acetylene compounds was carried out according to Mannich in equimolecular ratios of reagents: The main starting compound - aminoaminocolchamine (1) for the performed syntheses was isolated from Colchicum luteum baker growing in the Surkhandarya region.

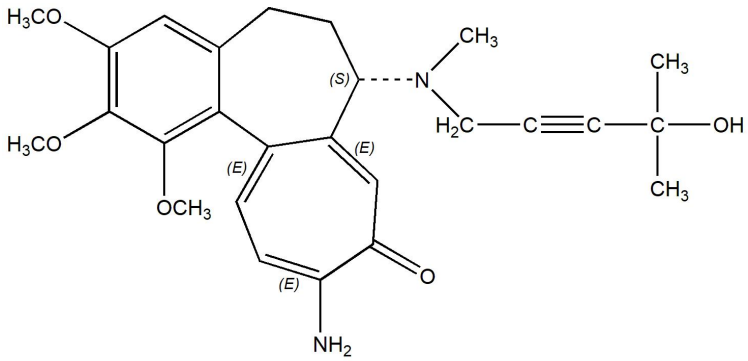
As a result, we synthesized; 4-(colchami-noN/1,1-dimethylbutyne-2) carbinol (3).

The obtained compounds are light yellow powders with close Rf values. At the same time, in chromatographic mobility, they differ greatly from the original aminoaminocolchamine, having a high Rf value.

Characteristic of all acetylene derivatives is the presence in their PMR spectra of a two-proton doublet from the bridging N-CH_2- group, which appears in the region of 3.32-3.38 ppm. The bridging OCH3 group present in compounds 4-5 forms a narrow two-proton doublet in the region of 4.53-4.70 ppm. The structures of the synthesized compounds are confirmed by IR and PMR spectra. In the IR spectra of compounds with an ester group (3-4), absorption bands of the carbonyl group (1735-1730 cm1) appear. The aminoaminocolchamine fragments of the synthesized compound in the PMR spectra do not differ significantly: the signals of the N-methyl group appear at 2.20-2.22 ppm, methoxyl groups - 3.56-3.60 (at C-1) and 3.82-3.85 ppm. (at C-2, C-3 C-10), proton H-4 - at 6.44-6.51 ppm, H-8 - 7.90-7.96 ppm, H-11 -6.68-6.75 ppm and H-12 - 7.17-7.22 ppm.

eISSN: 2349-5715 pISSN: 2349-5707

Volume: 11, Issue 12, December-2024 SJIF 2019: 4.702 2020: 4.737 2021: 5.071 2022: 4.919 2023: 6.980 2024: 7,662



Experimental part

a) Derivatives of aminoaminocolchamine with methylethylethynyl carbinol. A 1.0 g sample of aminoaminocolchamine was dissolved in 17 ml of dried and freshly distilled dioxane and 0.12 g of paraform, 0.01 g of hydroquinone and 0.03 g of zinc chloride were added to the solution. After that, an equimolecular amount of dimethylethynyl carbinol was added to the solution and the contents of the flask were mixed well. Reaction conditions are given in Table 1.

Table 1

Reaction conditions of dimethylethynylcarbinol with aminoaminocolchamine

№	Reagent	Estimated amount of reagent	The amount of reagent taken	Product yield (%)
1	Aminoaminocolchamine	0.78	1.0	96

The reaction mixture was heated on a glycerol bath with a reflux condenser at 80-100° for 6-8 hours. The end of the reaction was determined by thin-layer chromatography of the reaction mixture. After the reaction was practically complete, the substances insoluble in dioxane were separated by filtration and the solvent (dioxane) was distilled off on a rotary unit. The residue was dissolved in 20-30 ml of chloroform, the resulting very dark chloroform solution was extracted three times with 20 ml of 5% acetic acid. The acetic acid extract contains unreacted aminoaminocolchamine, which was isolated by alkalizing the acidic solution with ammonia and extracting with chloroform.

The chloroform solution of the reaction product, after separation of the initial aminoaminocolchamine, was dried over anhydrous sodium sulfate, the sulfate was filtered and the filtrate was passed through a small layer (5-7 g) of aluminum oxide. In this case, the dark extract became much lighter. The solvent was distilled off and the reaction product was dried in a vacuum desiccator. The final reaction products were obtained as non-crystalline light yellow powders.

4-(aminoaminocolhaminoN/1,1-dimethylbutyn-2) carbinol(3).

IR spectrum: 1100, 1170, 1720, 2570, 2950, 3400, 3540 см-1.

PMR spectrum: 1,26; 1,45; 1,49 (CH_3CH_2), 1,98 (CH_3), 2,16 (N-CH_3), 3,58; 3,85 x2, 3,88 (3H x 4, cc, 4OCH_3), 5,16 (OH), 6,48 (H-4), 6,94 (H-11), 7,24 (H-12 и H-8) м.д.

Conclusions

A new derivative of aminoaminocolchamine with dimethylethynylcarbinol has been synthesized. The synthesized compound has been confirmed by PMR and IR spectral data. The obtained compounds have characteristic spectral properties, including the presence of an acetylene bond, which reduces their toxicity. Spectral analysis confirms the structural features and high chromatographic mobility of the new compounds.

eISSN: 2349-5715 pISSN: 2349-5707

Volume: 11, Issue 12, December-2024 SJIF 2019: 4.702 2020: 4.737 2021: 5.071 2022: 4.919 2023: 6.980 2024: 7,662

References:

1. Yusupov M.K., Alikulov R.V. On the reaction of opening of the tetrachodroisoquinoline core to homoproaporphine bases. Crokiamine structure // electron scientific journal. Tashkent: “University”, 1992. p. 45-48.
2. Alikulov R.V., Alimnazarov B.Kh., Nuraliev G.T., Geldiev Yu.A. Structure of the new homoproaporphine alkaloid regecolquin // Universum: Chemistry and biology. electron scientific journal. 2019. No. 2(56). -p. 8-12.
3. Аликулов Р.В. Алкалоиды Colchicum kesselringii Rgl. и Merendera robusta Bge. строения новых гомопроапорфиновых и гомоапорфиновых алкалоидов. Дисс. на соиск.уч.степ. к.х.н., Ташкент, 1993. С. 53-57.
4. Alikulov R.V., Alimnazarov B.Kh., Geldiev Yu.A., Ruzieva B.Yu. Structure of a new homoproaporphine alkaloid 12-demethylylutein // Universum: Chemistry and biology. electron scientific journal. 2018. No. 3(45)
5. Юсупов М.К., Аликулов Р.В., Чоммадов Б.Ч., Насирова Б., Закиров С. Новые N-ацилные производные колхамина // Четвертое всесоюзное совещание по химическим реактивам. Тез. докл. и сообщений. Баку. 1991.
6. Alikulov R.V. Turaev Kh.Kh., Atamurodova D.M., Alimnazarov B.Kh., Durmonova S.S. Structure of 12-demethylregecoline // Universum: Chemistry and biology. electron scientific journal. 2019. No. 6(60).
7. Alikulov R.V. The structure of lutherine // Universum: Chemistry and biology: electron scientific journal. 2019. No. 6(60).