Esters of 4-Arylamino-2-butynic and 4-Arylamino-3-haloid-2-butenic Acids as Physiological Active Compounds

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On the base of chemical literature data analysis we have been demonstrated earlier, that biogenic and nonbiogenic amino acids and their derivatives having triple carbon - carbon bond in the molecules evince the physiological activity different types - from antibacterial to psychotropic.

It has been found by us that 4-aryl amino 2-butynic acids esters (2) can be obtained in one stage by catalytic oxydative methoxy carbonylation of N-propargyl aryl amines (1) with yields from 25 up to 60 %. Palladium chloride is used as catalyst. The copper (II) chloride is utilized for reoxydation palladium, reduced in reaction. The sodium acetate is the trapper for hydrochloride evolving in process.

$$RR'C_6H_3NR''CH_2C\equiv CH \xrightarrow{i} RR'C_6H_3NR''CH_2C\equiv CCOOR'''$$

1 a-f 2 a-g

i CO, $PdCl_2$, R'''OH, $CuCl_2$-$2H_2O$, NaOAc

1a, 2a R=R'=H, R''=R'''=Me; 2b R=R'=H, R''=Me, R'''=Et;
1b, 2c R=Cl, R'=R''=H, R'''=Me; 1c, 2d R=3-Cl, R'=R''=H, R'''=Me;
1d, 2e R=2-Cl, R'=R''=H, R'''=Me; 1e, 2f R=2-Cl, R'=5-Cl, R''=H, R'''=Me;
1f, 2g R=4-NO_2, R'=R''=H, R'''=Me

The 4-aryl amino 2,3-dichloro-2-butenic acids esters (3) have been obtained in several cases in place of butynic acids esters (2) or together with them on varying of reaction duration and reagents correlation.

$RR'C_6H_3$-NH-CH_2-CCl=CCl-$COOCH_3$

3 R = H; R' = 2-Cl or 4-Cl.

It has not been succeeded to synthesize the own acids by this manner. But we have could to obtain the 4-methyl phenyl amino 2-butenic acid (4) with yield 84 % by carboxylation of methyl phenyl amine (1a) lithium derivative.

$$C_6H_5N(CH_3)CH_2C\equiv CH + CH_3Li \rightarrow [C_6H_5N(CH_3)CH_2C\equiv CLi] \xrightarrow[2.\ H_3O^+]{1.\ CO_2} C_6H_5N(CH_3)CH_2C\equiv CCOOH$$

1a 4

The 4-methyl phenyl amino 3-haloid 2-butenic acids (5a, b) have been obtained by amino acid (4) hydrohalogenation with yield from 40 up to 80 %:

$$4 + HX \rightarrow C_6H_5N(CH_3)CH_2CX=CHCOOH$$

5 a,b

a X = Cl, b X = I

Amino acids (5a, b) are obtained in the form of singles trans-isomers. All new compounds structures have been confirmed by complex of spectral and elemental analysis methods.

Tests for different physiological activity types show, that methyl ester (2a) has fungicidal effect, ethyl ester (2b) - fungicidal and antistaphylococcic effects and amino acid (5b) - analgetic effect.