PHYSIOLOGICALLY ACTIVE PAPAVERINE DERIVATIVES

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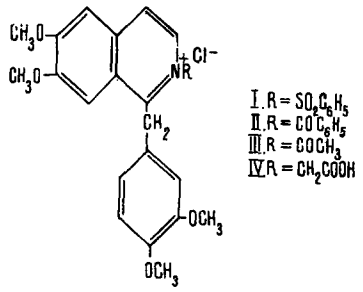
To obtain new biologically active compounds [1-3] we have studied the reaction of papaverine with the chlorides of some sulfonic and carboxylic acids and with chloroacetyl chloride. Compounds were obtained with the general formula



I. R = $SO_2C_6H_5$
II. R = COC_6H_5
III. R = $COCH_3$
IV. R = CH_2COOH

The purity of the reaction products was checked by thin-layer chromatography on silica gel fixedwith gypsum in the benzene–ethanol (10 : 1) system and by paper chromatography in the butan-1-ol–acetic acid–water (4 : 1 : 5) system using Dragendorff's reagent to reveal the spots. The IR spectra were recorded on a UR-10 instrument (KBr).

The compounds obtained possessed hypotensive and spasmolytic activity (Table 1).

*Deceased.

TABLE 1. Physicochemical Characteristics of the Products Synthesized

Compound	Yield, %	mp, °C	R_f	IR spectra
N-Phenylsulfonylpapaverinium chloride (I)	60	200 (decomp)	0,79	1364, 1220 cm^{-1} (symmetrical and asymmetrical stretching vibrations of an SO_2 group)
N-Benzoylpapaverinium chloride (II)	74,4	198	0,76	1742 cm^{-1} (stretching vibrations of an Ar – CO carbonyl), 1617, 1638 cm^{-1} (vibrations of C – N and C = O in N – CO)
N-Acetylpapaverinium chloride (III)	81,6	217 (decomp)	0,80	1725, 1765 cm^{-1} (–C = O vibrations in CH_3CO)
N-Carboxymethylpapaverinium chloride (IV)	74,3	210 (decomp)	0,74	1412 cm^{-1} (symmetrical COO^- stretching vibrations), 1617, *16 5 cm^{-1} (– N – C vibrations in N – CH_2), 3400 cm^{-1} (stretching vibrations of an OH group)

*Digit missing in Russian original – Publisher.

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EXPERIMENTAL

N-Phenylsulfonylpapaverinium Chloride. A solution of 5 g of papaverine in 50 ml of absolute chloroform and 3 ml of benzenesulfonyl chloride was boiled under reflux for 4 h. After the end of the reaction, 150 ml of absolute ether was added to the chloroform. The product that deposited was separated off and washed with absolute ether. It was purified by two reprecipitations from chloroform with ether. The other compounds were obtained similarly (see Table 1).

SUMMARY

N-Phenylsulfonyl-, N-benzoyl-, N-acetyl-, and N-carboxymethylpapaverinium chlorides, which possess hypotensive and spasmolytic properties, have been obtained from the alkaloid papaverine.

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