the dihydrazide. It was also observed that the dihydrazide had stronger inhibitory action than the monohydrazide upon glutamic acid decarboxylase of *E. coli*. The antagonism of hydrazides to aspartic acid was non-competitive in all the cases but growth inhibition of *E. coli* was more easily recovered by asparagine rather than by aspartic acid. Consideration were made on the biological activity of amino acid hydrazides from foregoing experimental results.

Antagonistic Action of CNS Stimulants against Barbiturates in Mice

Ichiro TACHI

(Ogiu Laboratory)

Japanese Journal of Pharmacy and Chemistry
(*Yakugaku Kenkyu*), **29**, 1052 (1957)

After Maloney *et al.* (1931) reported that Picrotoxin reduced anesthesia by barbiturate, antagonistic action of many kinds of CNS stimulants against barbiturates has been observed by various workers. But the comparative evaluation of their actions is not yet sufficient.

In this paper, the comparison was made with antagonistic action of LD 50 CNS stimulant against barbiturate hypnosis and, of 1/2 LD 50 CNS stimulant against Evipan Sodium LD 50. The results obtained are shown in the following table.

CNS stimulant	Antagonistic effect in mice		
	to Veronal hypnosis	to Evipan hypnosis	to Evipan toxicity(LD 50)
Picrotoxine	###	###	###
β-methyl-β- ethyl glutarimide	##	###	###
Metrazol	##	##	###
N,N′-Dibutyl-N.N′-dicarboxy morpholide etheylendiamine	+	+	##
Strychinine	+	−	+
Coffeine sodium benzoate	−	−	±
Methamphetamine	−	−	−

Marked, ## moderate, + slight, ± none, − on the contrary, synergistic.

Pharmacology of Benzhydrol Derivatives

Hajime FUJIMURA and Katsuya ŌHATA

(Ogiu Laboratory)

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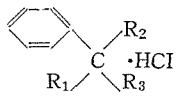
ABSTRACTS

(*Yakugaku Kenkyu*), **29**, 1041 (1957)

The pharmacological action of several compounds derived from Pipradrol (MRD-108) was investigated.

These compounds have the following structures.



Compound	R_1	R_2	R_3
11—1	$-C_6H_5$	-HO	$-CH(-CH(CH_3)_2)(-NH-CH_3)$
11—2	$-C_6H_5$	-HO	$-CH(-CH_3)(-NH-CH(CH_3)_2)$
11—3	$-C_6H_5$	-HO	$-CH(-CH_3)(-NH-CH_2-CH_2-CH_3)$
11—4	$-C_6H_5$	-HO	$-CH(-CH_2-CH_3)(-NH-CH_2-CH_3)$
11—5	$-C_6H_5$	-HO	$-CH(-CH_2-CH_2-CH_3)(-NH-CH_3)$
11—6	$-C_6H_5$	-HO	$-CH(-CH_2-CH_2-CH_3)(-NH-CH(CH_3)_2)$
12—1	$-C_6H_5$	-H	$-CH(-CH_3)(-NH_2)$
12—2	$-C_6H_5$	-H	$-CH(-CH_3)(-NH-CH_3)$
Pipradrol	$-C_6H_5$	-HO	$-CH(-CH_2-CH_2)(-NH-CH_2-CH_2)$
Methamphetamine	-H	-H	$-CH(-CH_3)(-NH-CH_3)$

These agents induce a coordinated hyperactivity and cause changes in behavior patterns in mice. These effects are, qualitatively, almost the same as those induced by Pipradrol and Methamphetamine in the same animals. The derivatives are more effective than Pipradrol in shortening the sleeping time caused by Hexobarbitone sodium in mice.

Other pharmacologic properties of these drugs in experimental animals include slight potentiation of Morphine analgesia in mice, weak depressor in dogs, hypothermic action in mice, and inhibition of isolated rabbit auricle. But, in human volunteers, all the derivatives do not possesses the awakening effects as shown by Pipradrol or Methamphetamine.