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# Some Comparative Observations on *l*-Nicotine and Myosmine.

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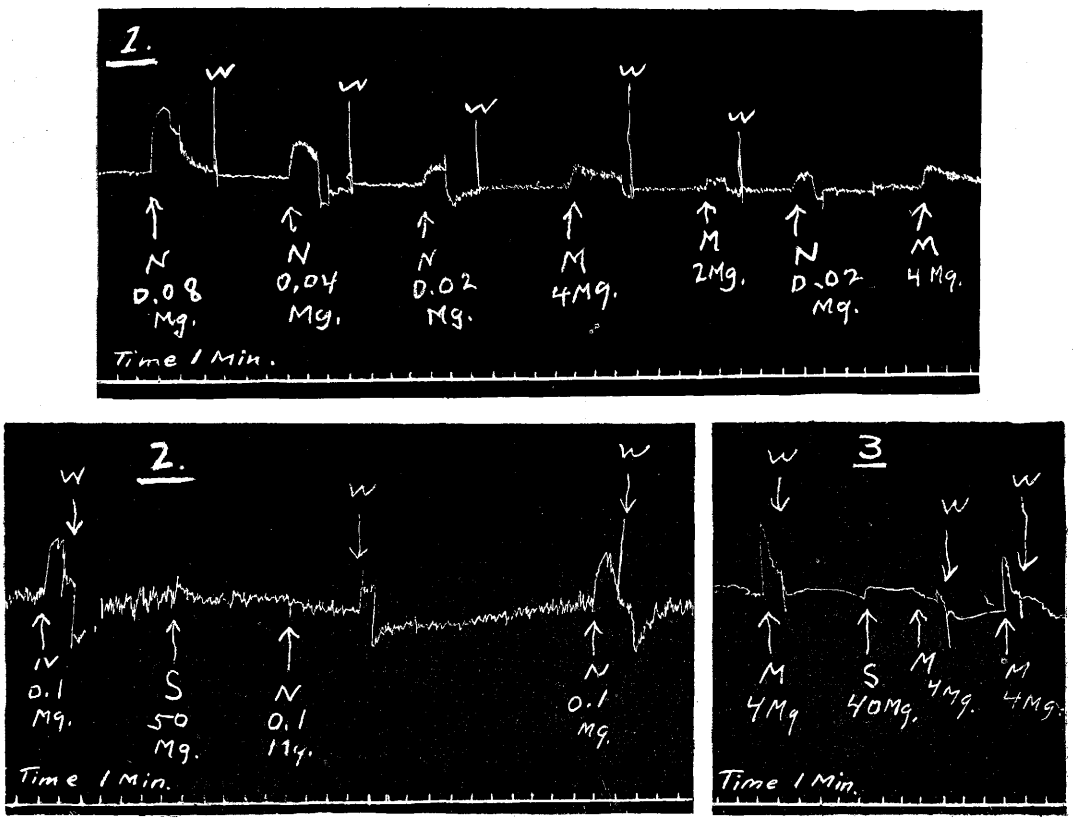
Myosmine* differs structurally from *l*-nicotine* by lacking the methyl group on the nitrogen of the pyrrolidine ring, which has been converted to a pyrroline ring by a double bond on the 2 carbons adjacent to the pyridine ring. The present report summarizes data on the acute toxicity of these 2 alkaloids for albino rats, and compares their actions on the isolated intestinal and uterine strips of guinea pigs.

The acute toxicity of myosmine was determined orally in 35 rats, and intraperitoneally in 12. The same numbers of rats and the same routes of administration were used for the determination of toxicity of *l*-nicotine. Both alkaloids were dissolved in distilled water and the pH of the solutions

* The samples of myosmine and *l*-nicotine were prepared by Dr. Abner Eisner of the Eastern Regional Research Laboratory.




Effect of *l*-Nicotine and Myosmine on the Isolated Guinea Pig Intestine.

Notations in all 3 figures are the same: N—nicotine; M—myosmine; S—sodium sulfathiazole; W—wash. Time intervals, 1 minute.

FIG. 1. Comparative effect of *l*-nicotine and myosmine. *l*-Nicotine appears to be *ca.* 200 times more effective than myosmine. (0.02 mg *l*-nicotine ≏ 4 mg myosmine).

FIG. 2 and 3. Showing the inhibiting effect of sulfathiazole on nicotine and myosmine contraction.

adjusted to approximately 7 with concentrated hydrochloric acid.

The approximate oral $LD_{50}$, expressed as mg per kg of body weight, for myosmine and *l*-nicotine was 1875 and 188 respectively. After intraperitoneal administration the approximate $LD_{50}$ for myosmine and *l*-nicotine was 190 and 30 respectively. The symptoms of toxicity produced by the 2 alkaloids were essentially the same, although the convulsions produced by large doses of myosmine were somewhat less violent than those produced by *l*-nicotine.

Segments of either intestine or uterus were suspended in a 50 cc bath of Ringer-Locke solution at 38°C and connected to a frontal writing lever for kymographic recording. In each case the effect of *l*-nicotine was first determined before myosmine was added.

Myosmine in concentration of 4 mg/50 ml (1:12,500) caused contraction of the isolated intestinal segments similar to that produced by *l*-nicotine in concentrations of 0.02 mg/50 ml (1:2,500,000). On the isolated uterus no effect was produced by either myosmine or *l*-nicotine.

Recently Pick, Brooks and Unna[1] have reported on the inhibitory effect of sulfathiazole on the activity of *l*-nicotine on the intestine. We have confirmed their studies and have extended this procedure to include myosmine.

Like nicotine, the effect of myosmine was inhibited by suitable doses of sulfathiazole. Removal of the sulfathiazole from the bath and washing the segments with fresh Ringer-Locke solution promptly restored the sensitivity of the intestinal segment to both myosmine and *l*-nicotine. The results are illustrated in Fig. 1-3. A detailed description of the individual tracings is given under the figures.

*Summary.* 1. The acute toxicity of myosmine was about one-tenth that of *l*-nicotine after oral administration. Intraperitoneally myosmine was about one-sixth as toxic as *l*-nicotine. 2. On isolated intestinal strips of guinea pigs, contraction by myosmine required about 200 times the concentration necessary in the case of *l*-nicotine. 3. Sulfathiazole inhibited the action of both myosmine and *l*-nicotine on isolated intestinal strips.

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## Effects of Colchicine on the Frog in Relation to Ovulation and Early Development.

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The property of inhibiting mitosis and inducing polyploidy[1-3] has made of colchicine a valuable tool in biological research. It has been used in studies on the rate of mitosis in various tissues.[4-6] It has been demonstrated that colchicine prevents the rise in viscosity[7-9] in the cell which normally occurs at fertilization and cell division and also lowers the surface tension in the dividing cell.[10] It has been used in studies on malig-

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