SOME ASPECTS OF THE PHARMACOLOGY OF ONOSMA

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Aqueous extracts of onosma (Onosma simplicissimum Linn.) stimulate diuresis and lower the body temperature in rats and prolong the duration of sodium amytal and hexobarbital narcosis in mice.

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Various species of onosma (Onosma simplicissimum Linn., Onosma echiodes Linn., Onosma bracteatum Wall.) are used in folk medicine (Siberia, Kazakhstan, India [2, 3]) as hypotensive, antipyretic, and tranquilizing agents. We have found no reference to studies of the pharmacology of native onosma.

We investigated the effect of a 10% infusion of O. simplicissimum Linn. on diuresis and body temperature in albino rats and on the duration of barbiturate narcosis in albino mice.

EXPERIMENTAL METHOD

The plants were gathered in Karaganda Region during the flowering period. The infusion was prepared in accordance with the State Pharmacopoeia. Experiments were carried out on 220 albino rats and 240 albino mice.

The animals were divided into groups with 20 in each. One group acted as control. The onosma infusion was investigated in rats in doses of 2, 1, 0.5, 0.1, and 0.05 ml/100 g and in mice in doses of 0.8, 0.4, 0.2, 0.1, and 0.02 ml/20 g body weight.

The diuresis was determined in animals fasting for 18 h against the background of water loading (rats of the control group were given 0.45% sodium chloride solution by mouth in a dose of 5 ml/100 g body weight, while the experimental animals received onosma infusion by mouth in the same value of liquid with the addition of sodium chloride up to 0.45%). Observations continued for 6 h (every hour) and 24 h after administration of the fluid. The volume of urine excreted was expressed per 100 g body weight.

The rectal temperature was measured by a medical thermometer, introduced each time to the same depth. Once a day for five days the control rats received a subcutaneous injection of isotonic NaCl solution at the rate of 2 ml/100 g body weight while the experimental rats received infusion of onosma in the same volume of 0.85% NaCl (injections of the infusion were also given daily for 5 days). Observations continued for 4 h (each hour after the injection).

The sedative properties of the infusion were assessed from its effect on the duration of the hypnotic action of the barbiturates. The duration of sleep, i.e., of lying on the side, was measured. For this purpose, half the mice received an intraperitoneal injection of hexobarbital and the other half of the mice an injection of sodium amytal, each in a dose of 0.7 mg/20 g body weight. The preparations were dissolved in 0.3 ml distilled water. Simultaneously with one of the barbiturates, the experimental animals received an injection of onosma infusion The results obtained were subjected to statistical analysis [1, 4].

EXPERIMENTAL RESULTS

In all the animals the greater part of the fluid administered was excreted in the first 6 h. The diuresis curve rose sharply during the first 2 h (in this period more than two-thirds of the six-hour volume of urine was excreted), after which it fell. The most marked changes in diuresis occurred in rats receiving onosma infusion in a dose of 2 ml/100 g body weight; in 6 h the control animals excreted 3.8 ± 0.2 ml urine, and in 24 h they excreted 6.1 ± 0.25 ml, while during the same time the experimental animals excreted 6.6 ± 0.2 ($P < 0.05$) and 7.7 ± 0.15 ($P < 0.05$) ml respectively, i.e., diuresis was increased by 73 and 26% respec-

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ly. The diuresis also changed significantly after administration of the preparation in a dose of 1 ml/ g; the 6 h diuresis was increased by 63% over the control value and the 24 h diuresis by 19%. In the mals receiving the infusion in doses of 0.5 and 0. 1 ml/100 g the changes in 24 h diuresis were not tistically significant. Administration of the preparation in a dose of 0.05 ml/100 g body weight gave no ect.

In the rats of the control group the body temperature during the period of observation varied from ± 0.05 to 40 ± 0.07°. By 1-2 h after administration of onosma infusion in a dose of 2 ml/100 g the body perature fell on the average by 1-1.5° ($P < 0.05$) and did not return to its original level in the course of . The temperature difference after administration of the infusion in doses of 1 and 0.5 ml/100 g body ght was also statistically significant. When the preparation was injected in a dose of 0.05 ml/100 g the ly temperature fell by 0.5° 1 h after administration.

Sodium amytal "sleep" in the control mice lasted 18 ± 0.8 min, and hexobarbital "sleep" lasted 5 ± 0.4 n. After administration of onosma infusion in doses of 0.8, 0.4, 0.2, and 0.1 ml/20 g body weight simul- eously with sodium amytal, the duration of "sleep" was increased by 120, 100, 66, and 38% respectively. ministration of the onosma preparation in the same doses along with hexobarbital was also effective (the ation of the lateral position was increased by 180, 140, 100, and 80% respectively). If onosma infusion s given in a dose of 0.02 ml/20 g, the duration of both sodium amytal and hexobarbital narcosis remained hanged.

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