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THE IMMOBILIZATION OF EUROPEAN BISON × CATTLE HYBRID WITH SUXAMETHONIUM

ZDALNE UNIERUCHAMIANIE HYBRYDA ŻUBRA Z BYDŁEM CHLORKIEM SUKCYNYLOCHOLINY

Bisoniana XXXII

A hybrid of European bison and a cow of the polish red breed was immobilized with suxamethonium chloride. The drug was administered from a distance using an automatic syringe and bow and arrow. Doses from 0.069 to 0.119 mg/kg were tested. Doses from 0.102 to 0.119 mg/kg proved effective. The animal would fell down within 4 to 6 minutes after the injection and remain immmobilize for 10 to 24 minutes. In one case action of suxamethonium was markedly prolonged with neostigmin. These experiments appeared to have no deleterious effect on the general health of the studied animal.

The purpose of this work was to determine a suxamenthonium dose which would immobilize a hybrid of European bison and domestic cattle and to test an automatic syringe of own design (Fig. 1).

The experiments were carried out in 1964. A female hybrid »Famela« [1]) was used. This animal was born on February 20, 1962 from a cross of a male European bison, *Bison bonasus* (L.) and a cow of the polish red-breed *Bos taurus dom.* L. (Zaniewski, 1967). For the experiments the hybrid was placed in a 300 m^2 enclosure. Water was available at all times but the animal was fed only after the experiments and the weighing.

Two drugs were used: 5% water solution of suxamethonium chloride (succinylcholine chloride) and in one instance neostigmine methylsulphate (Polstigmin), both produced by the Kraków Pharmaceutical Factory »Polfa«. The drug was administered intramuscularly with a syringe mounted an arrow (Fig. 2) which was shot from a bow from a distance of 4—7 m. The removable harpoon needle (Fig. 1) used for the experiments was made to order in the Factory of Surgical Instruments at Milanówek. The same equipment and procedures were almost simultaneously tested on Red deer, *Cervus elaphus* Linnaeus, 1758 (Zaniewski, 1966).

The first symptoms of suxamethonium action appeared approximately one minute before immobilization of the animal; the rump became unsteady, the limbs were broadly spread, the back was arching and then the limbs were contracted (Fig. 3). Immediately after the latter symptom of limb muscles paresis the hybrid lay down in normal position on the sternum. In two instances »Famela« fell to the side from the position on

[1]) Originally named »Pamela«.

the sternum and in one case a paresis of the tail muscles was observed. This was caused by the largest doses of suxamethonium administered to this animal. The reflexes of belching, licking, defecation and urination were observed in the immobilized hybrid. The respiration was accelerated from 24/min to 90/min by the largest dose of the drug. Feeling and consciousness were retained during the suxamethonium action period. Except in the first experiment, »Famela« reacted to the sight of the immobilizing equipment with unrest and attempts to escape. The syringe was falling off approximately one minute after the injection and then the animal was reassured. The harpoon needle was removed from the skin with forceps during immobilization of the animal or during feeding. Using the forceps was necessary as it was impossible to remove the needle from the tight and elastic skin using only the fingers.

Table 1.

Reaction of a hybrid to different doses of suxamethonium.

No. of exp.	Date of experiment	Dosages of suxamethonium, in mg/kg.	Minutes to	
			collapse	immobilized
1	Juli, 20	0.069	no	reaction
2	„ 20	0.074[3])	4	83
6	September, 11	0.119	6	24
7	„ 12	0.110	4	23
9	„ 15	0.104	6	14
11	„ 19	0.102	6	10
8	„ 14	0.101	no	reaction
10	„ 17	0.101	„	„
12	„ 22	0.100	„	„
4	Juli, 27	0.100[4])	„	„
3	„ 27	0.082	„	„
5	„ 28	0.064[5]) 0.064	„	„

[3]) This dose was administered 26 minutes after the previous one. Nine minutes afterwards neostigmin was injected.
[4]) Administered 147 minutes after the third experiment.
[5]) Two equal doses administered 7 minutes apart.

During the experiments the hybrid was immobilized five times with suxamethonium and in one case action of this drug was prolonged with neostigmin. Doses of suxamethonium ranging from 0.102 mg/kg to 0.119 mg/kg used in experiments No. 6, 7, 9 and 11 were effective i. e. caused immobilization of the animal. Famela was immobilized within 4 to 6 minutes after application of these doses and remained immobilized for 10—24 minutes, respectively (Table 1). Immobilization of the hybrid in the second experiment resulted from cumulative action of the suxamethonium given in the first experiment and that administered 26 minutes later. Neostigmine administered in the second experiment (0.03 mg/kg) extended action of suxamethonium markedly (Table 1). Doses of drug from 0.069—0.101 mg/kg used in experiments No. 1, 3, 8, 10 and 12 proved ineffective. Lack of reaction to the dose used in experiment No. 8 is difficult to explain (Table 1).

Immobilization of hybrid allowed installing a nasal ring, examination *per rectum* and several other measures. Rectal examination on Juli 20, 1964 revealed limp and empty uterine horns. The ovaries were smooth; the left had the shape and size of a walnut and the rigth — of a date.

Although the experiments were often done twice during the day or else day after day (Table 1) the hybrid did not suffer to have any adverse effects on the general health of the animal as best evidenced by the fact that »Famela« gave birth to a calf some year and a half after the described experiments (Krasińska, 1967). Only after application neostigmin the hybrid was tired and apathetic still 12 hours after the injection, while hunger and thirst seemed normal.

The doses of suxamethonium immobilizing hybrid were compared with corresponding doses reported for several representatives of genera *Bos* and *Bison* (Table 2). Doses effective in the hybrid were similar to those

Table 2.

Comparison of the reaction of several representatives of genera *Bos* and *Bison* to the suxamethonium.

Species	Effective doses of suxamethonium in mg/kg.	Author
Hybrid	0.102 — 0.119	Zaniewski
Bos indicus	0.117	Pistey *et al.*, 1959
Bos taurus dom.	0.020 — 0.040	Stove, 1955
Bison bison	0.079	Thomas (after Westhues *et al.*, 1961, after Dietz *et al.*, 1962)

effective in zebu (*Bos indicus*), somewhat higher than those effective in American bison (*Bison bison*) and five times higher than doses used for domestic cattle (*Bos taurus dom.*).

The automatic syringe worked satisfactorily and was found useful in remote immobilization of the hybrid.

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Received, March 3, 1967.

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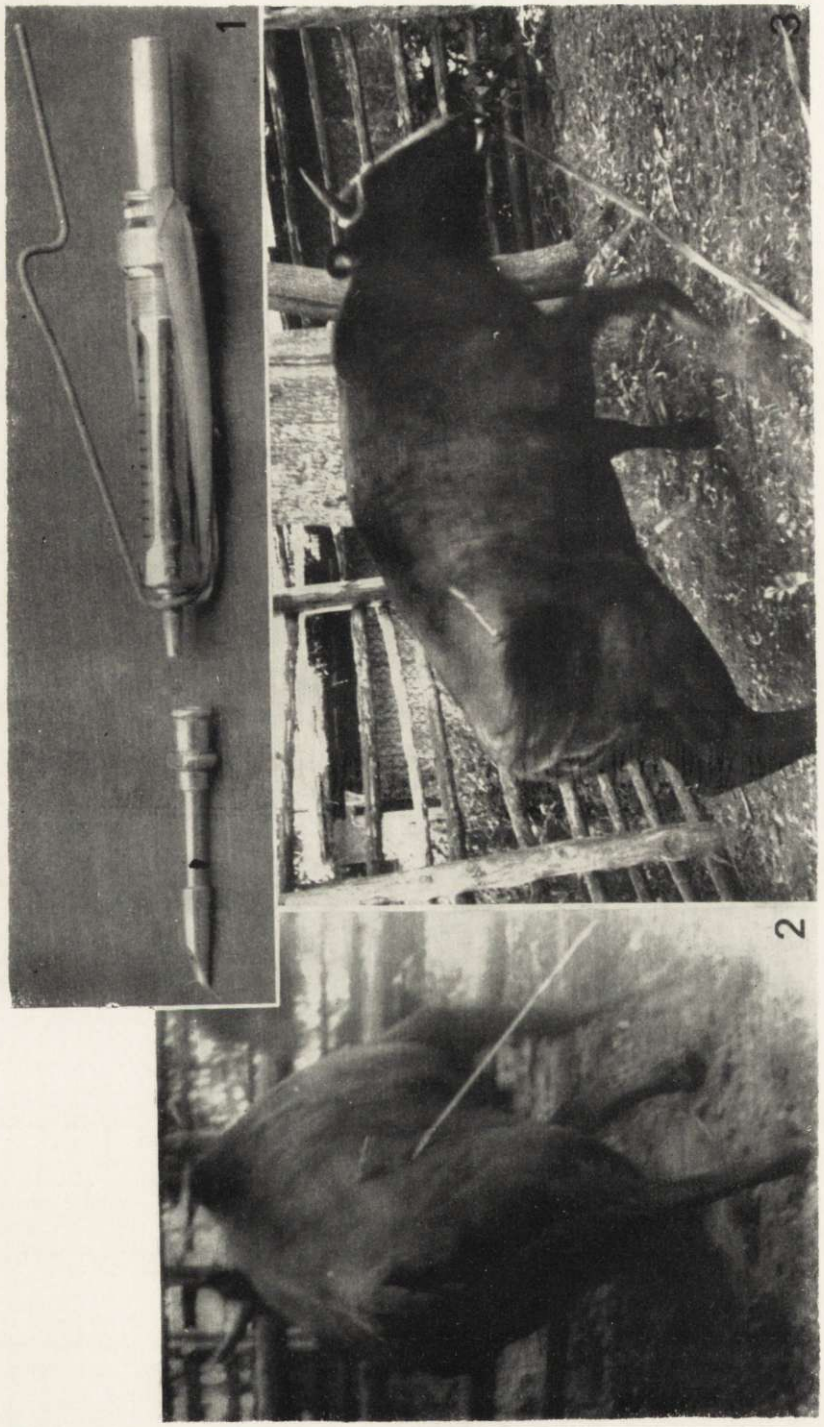
Plate XXII.

Fig. 1. Automatic syringe for remote administration of a drug.
Fig. 2. Location of syringes in the rump of the animal.
Fig. 3. Moment of fall down after the dose of suxamethonium.



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