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Immobilization of Coypus (*Myocastor coypus*) with Ketamine Hydrochloride and Xylazine Hydrochloride

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ABSTRACT: A combination of 100 mg/ml of ketamine hydrochloride (Ket) and 20 mg/ml of xylazine hydrochloride (Xyl) was used to immobilize coypus (*Myocastor coypus*). Eight mature coypus (four males and four females) were injected intramuscularly with doses ranging from 2.33 to 6.25 mg/kg of KET and 0.25 to 0.86 mg/kg of Xyl. The mean (\pm SE) time for induction, arousal, and recovery were 7.3 ± 2 min, 23.5 ± 0.3 min and 46 ± 2.5 min, respectively. The mean \pm SE doses injected were 4.07 ± 0.52 mg/kg Ket (range, 2.33 to 6.25 mg/kg) and 0.5 ± 0.08 mg/kg Xyl (range, 0.25 to 0.86 mg/kg). No adverse responses were observed in any of the animals treated.

Key words: Coypu, *Myocastor coypus*, ketamine hydrochloride, xylazine hydrochloride, chemical immobilization, field study.

There are many studies regarding biology and management of the coypu (*Myocastor coypus*), both in nature and in captivity, mainly in countries where it has been introduced (Kinler et al., 1987), but there are few published data about the chemical immobilization of this species (Van Foreest, 1980; Jalanka and Roeken, 1990). This knowledge would be useful in field studies where animals are handled for only short periods, and then are released in the field. Xylazine (Xyl) is a sedative with analgesic and muscular relaxant effects that is frequently used combined with dissociative anesthetics such as ketamine (Ket), of short duration and ample safety margin (Greene and Thurmon, 1988). This combination usually results in smooth induction and recovery (Belant, 1991) and has been used successfully with large herbivores, carnivores, furbearers and rodent species (Szabuniewicz et al., 1978; Jessup et al., 1983; Logan et al., 1986; Belant, 1991). Our objective was to determine the effects of several combination of Xyl-Ket

as a chemical immobilizer on coypus in field studies.

During July 1990 eight mature coypus were captured in a freshwater marsh in the delta of the Paraná River, 5 km east of Puerto Constanza, Entre Ríos, Argentina ($34^{\circ}48'S$, $58^{\circ}57'W$), using leghold traps (Oneida-Victor No. 2, A. Jonsson Co., Buenos Aires, Argentina). The strength of the springs was modified to reduce striking and clamping actions of the trap in order to reduce any possible damage in the animals. We studied four male and four female coypus of varying age classes that weighed from 2 to 6.1 kg. Age and reproductive condition were estimated from body mass (Crespo, 1974). Coypus were put in net bags for transportation to the immobilization site. Immobilization was carried out with a 1-ml hand-syringe.

Each coypu was injected intramuscularly with a combination of 100 mg/ml Ket (Ketolar, Parke Davis S.A., El Prat de Llobregat, Barcelona, Spain) and 20 mg/ml Xyl (Rompún, Instituto Bayer de Terapéutica Experimental S.A., Barcelona, Spain). If required, an additional injection of 0.75 mg/kg Ket and 0.15 mg/kg Xyl was used to maintain anesthesia.

The general state of anesthesia and animal activity was controlled throughout the experiment, and the times till induction, arousal and recovery were recorded. Induction time was defined as the time from injection until the animal lost consciousness. Arousal time was defined as the time between loss of responsiveness until it started to lift and move its head, and recovery time was defined as the time from injection until it could remain standing in spite of the box being moved to different positions.

TABLE 1. Responses of eight sexually mature coypus (four males and four females) immobilized with ketamine hydrochloride and xylazine hydrochloride, Delta of the Paraná River, Argentina, July to August 1990.

	Median	Mean	SE	Range
Ketamine hydrochloride (mg/kg)	4.12	4.07	0.52	2.33–6.25
Xylazine hydrochloride (mg/kg)	0.45	0.50	0.08	0.25–0.86
Individual weight (kg)	3.65	3.63	0.42	2.00–6.10
Induction time (min)	7.00	7.30	2.00	5.50–9.50
Arousal time (min)	23.0	23.5	0.31	23.0–25.0
Recovery time (min)	45.5	46.0	2.53	38.0–55.0

Sedated coypus received a radio collar (Biotrack Ltd., Wareham, United Kingdom) and were kept in boxes with a reed bedding (*Scirpus californicus*) until complete recovery. They then were released at the capture site. Due to the low temperature (5 C), animals were kept in a sunny spot protected from the wind during the period of manipulation and recovery to reduce the risk of hypothermia.

The mean (\pm SE) doses injected were 4.07 ± 0.52 mg/kg Ket and 0.5 ± 0.08 mg/kg Xyl. The mean (\pm SE) induction time was 7.3 ± 2 min ($n = 8$). No evidence of adverse responses were observed in any animals. The mean (\pm SE) arousal and recovery times were 23.5 ± 0.3 and 46 ± 2.5 min, respectively ($n = 8$) (Table 1).

Only two specimens, both sub-adult males, had to receive additional injections of Ket and Xyl. They probably were excited because they were transported together in the same net bag to the site of immobilization. However these extra doses were relatively low as compared with the total amount injected (4.5 and 4.25 mg/kg Ket and 0.8 and 0.65 mg/kg of Xyl respectively).

Two coypus had partial immobility of one of their limbs for several minutes, perhaps due to use of leghold traps. However, leghold traps were chosen due to their greater efficiency, particularly in water sets, as compared with other live capture methods used for this species (Robicheaux and Linscombe, 1978).

The average dose of Ket used in this study (4 mg/kg) was similar to that used

in captive coypus by Jalanka and Roeken (1990) but lower than that recommended by Van Foreest (1980). Jalanka and Roeken (1990) used 5 mg/kg Ket in 18 coypu immobilizations but replaced Xyl with 0.1 mg/kg of medetomidine. Van Foreest (1980) recommended an average dose of 11 mg/kg Ket for surgical anesthesia but he considered that 5.3 mg/kg Ket and 0.42 mg/kg Xyl were sufficient for handling and physical examination of captive coypus.

The use of Ket and Xyl with average doses of 4 and 0.5 mg/kg, respectively, seemed to be enough to immobilize this species in the field, allowing a safe and proper manipulation, and a swift and complete recovery.

However, owing to the limited information on this species, we suggest further experiments with different dosages of Ket and Xyl and with other drugs, such as medetomidine, to maximize the field efficiency of immobilization, without affecting unnecessarily the health of the animals.

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