

Distance Immobilisation by Telinject of Griffon Vultures *Gyps fulvus* with the drug Ketamine-Xylazine*

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INTRODUCTION

During a study on home range size and flight biology of a small colony of Griffon Vultures in the European Alps (Mäck & Bögel 1990; d'Oleire-Oltmanns *et al.* 1989; Bögel see these proceedings), birds have to be captured and radio-tagged. This colony, which descends from the Salzburg Zoo, still depends in its food requirements on a feeding station at the zoo. As these birds can behave quite tamely at the zoo, it was easy to capture them years ago by baiting them with meat and catching them manually in an inattentive moment. Unfortunately, Griffons not only learn very quickly, but there also seems to be a kind of intraspecific communication within the colony: within a few attempts all birds seem to be informed quite well about your capturing intentions, even if they have not been present themselves. Other commonly used capturing methods (Bloom 1987) like baited snare traps or enclosure traps for large raptors are not suitable due to the feeding behaviour of the vultures. Snare loops are too dangerous because Griffons feed in groups, acting very aggressively with their necks low above the ground. Enclosure traps are designed for solitary birds and therefore are impracticable as too many birds are standing around the carcass. An application of canon nets is critical in terms of handling a couple of birds simultaneously. Furthermore, Griffons act extremely timid if anything is changed at the feeding place. Oral drugs are hardly applicable in the appropriate dose, poorly tolerated, and therefore can be dangerous (Day *et al.* 1980; Ebedes 1973).

METHODS

Distance application of drugs by gun is a method which is commonly used on mammals (Day *et al.* 1980). In spite of that, very few studies are published on applying this method to birds (Rietschel & Wiesener 1982). Even on the immobilization of birds by injecting drugs few data are available (Allen & Oosterhuis 1986; Van Heerden *et al.* 1987; Degernes *et al.* 1988). Therefore experiments were carried out trying to adapt this method for capturing vultures. A mixture of ketamine-xylazine was used (HBM, concentration: 125 mg xylazine + 100 mg ketamine hydrochloride / ml solution). A dose of 0,034-0,044 ml HBM per kg (estimated) body weight has

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been injected by an 1.4 ml TELINJECT syringe (type S 100 V3) which is divided into a chamber for the drug and another for air pressure (Fig. 1). A silicone plug avoids injection of the drug before the needle penetrates the body. Total weight of the syringe is 9 g (incl. drug). Immediately after catching the immobilized bird, Yohimbine is used as antidote in a dosage of 0.1 mg/kg. As Griffons try to escape and hide during induction time, a syringe with integrated telemetry transmitter has been developed for ensuring the localisation of the narcotized bird (see Fig. 1). The transmitter (Fig. 2) fits into a housing that can be plugged to the rear side of any standard TELINJECT syringe. By this, weight and dimensions of the syringe are increased by 6 grams, resp. 78 millimetres. A specially designed needle has to be used for ensuring that the syringe keeps fixed to the body during flight. A shock absorber compensates for the increased power of hit.

Fig. 1: TELINJECT syringe type S 100 V3 with and without integrated telemetry transmitter.

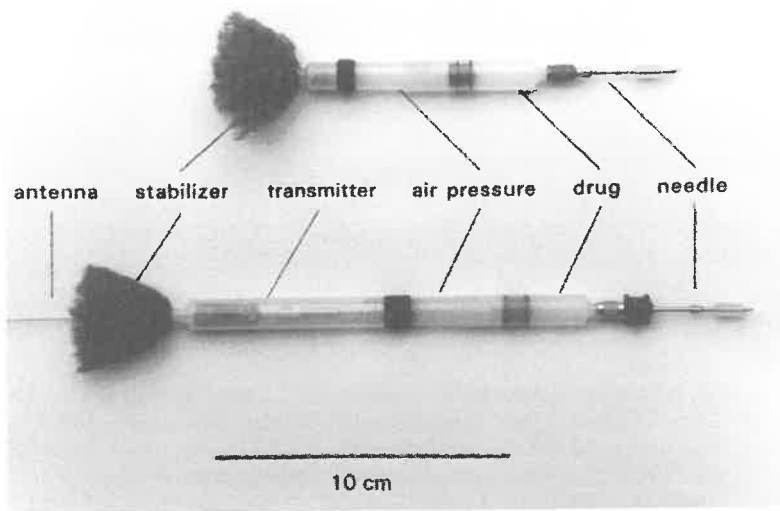
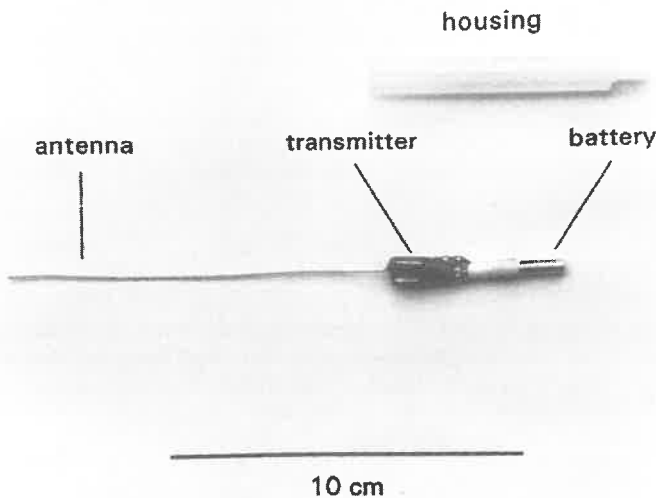


Fig. 2: Telemetry transmitter (AUSTEC KG 80, modified) with battery (NATIONAL BR 425).



RESULTS AND DISCUSSION

Three of five attempts have been successful. In those cases without success, the syringe was rejected by the plumage before the needle entered the body. The successful applications showed that induction time varies greatly according to the injection point and the tissues which were hit: values ranged from 7 (pectoral muscle) to 20 minutes (shoulder / air sacculus). Time for recovery usually takes 0.5 -1 hour until full body control is regained. The precision of hits varies with distance and air pressure of the gun. For a distance of 10 metres and an air pressure of 4.5 bar, all injection points are covered by the pectoral muscle (Fig. 3). Compared to that, at a distance of 15 metres (pressure 6 bar) there is an increased risk of missing the pectoral muscle and thus of injuring the bird seriously (Fig. 4). Shooting at this distance, we once hit a vulture at the shoulder with the needle penetrating an air sacculus. Anyway, the Griffon completely recovered within two days. Compared to the published results on other vulture species, the ketamine dosage used in this study is 2.5-10 times lower resulting in a prolongation of the induction time by a factor of 1 - 10 (Allen & Oosterhuis 1986; Van Heerden *et al.* 1987). This will mainly be caused by a non-intravenous, but diffuse, injection. For the same reason, the recovery times were prolonged by 1-6 times compared to other studies in which an antidote drug has been applied (Allen & Oosterhuis 1986; Degernes *et al.* 1988). Yohimbine as antagonism drug is recommended as the recovery time is significantly shorter (up to 10 times, see Degernes *et al.* 1988).

Fig. 3: distribution of hits for a distance of 10 metres (air pressure: 4.5 bar) (hits on the left and right side are equally distributed but are all projected to the right side).

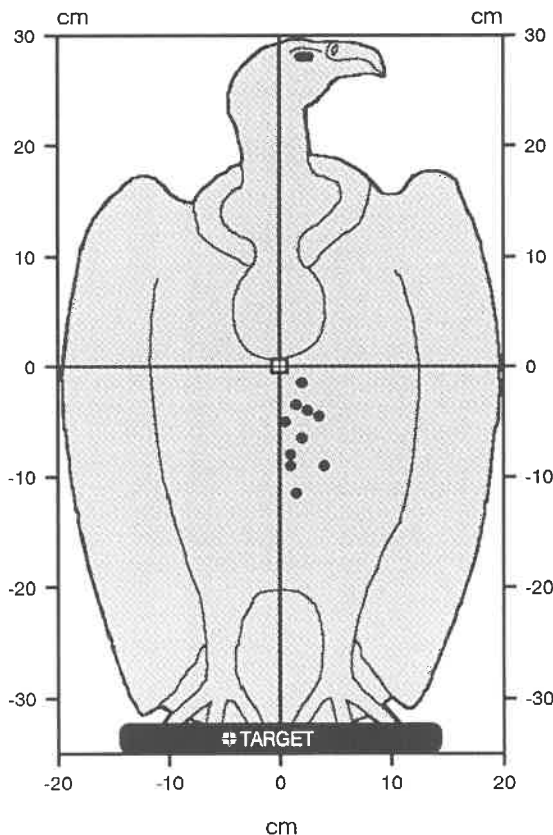
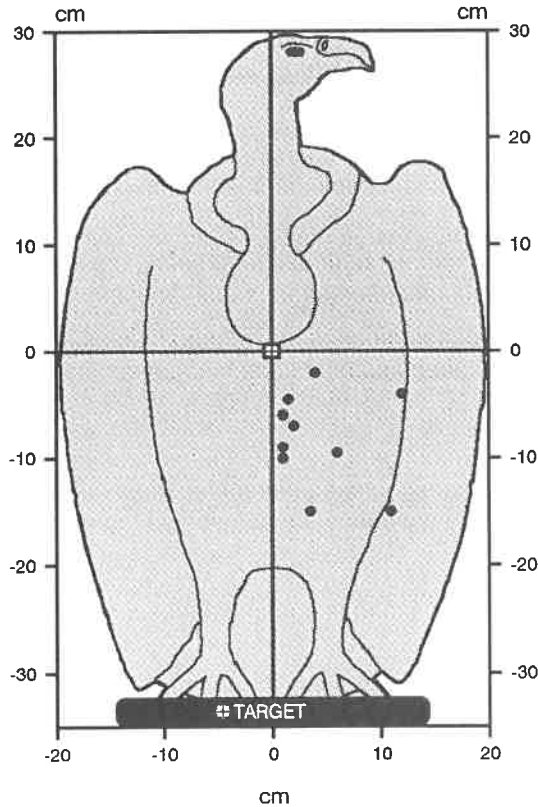


Fig. 4: distribution of hits for a distance of 15 metres (air pressure: 6:0 bar) (hits on the left and right side are equally distributed but are all projected to the right side).



CONCLUSIONS

Distance immobilisation of large birds by TELINJECT gun can be an adequate alternative if other capturing methods fail or if they are too dangerous. The described method cannot guarantee success because there is a certain risk that the syringe gets rejected by the plumage. Shooting from below, for example at a bird perching in a tree, clearly reduces this source of failure, but is not always possible. Applying this method on distances greater than 10 metres greatly increases the risk of injuring the birds. Improvements on the ballistic characteristics of the integrated transmitter syringe might increase the possible spectrum of application. Concerning this and the fixation of the transmitter syringe to the body during flight further investigations are required.

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Eagle Owl *Bubo bubo*