



Short Communications

Investigation on the efficacy of a utility model „Remote piston injector for veterinary use“

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Abstract. *The effectiveness of a utility model - remote piston injector for veterinary use was investigated. The injector is from the field of applied veterinary technology, hand tools, instruments and accessories for the application of treatment and prevention of domestic and wild animals. It can be used safely for the application of various types of veterinary medicinal products in relation to animal health and welfare. The utility model is part of the technique that serves to improve veterinary care and is a mobile tool related to the prevention, diagnosis and treatment of animal diseases. It has been found that it successfully provides treatment to dangerous animals with drugs, vaccines, etc. from a distance safely for humans, using cheap disposable or remote syringes that are protected by the injector housing.*

Keywords: applied veterinary technology, domestic and wild animals

Introduction

Prevention, diagnosis, treatment and rescue of animal life are a priority for veterinary medicine. This is achieved not only with excellent knowledge in the field but also with a wide range of tools and aids. They are important for the *safety and health of doctors* who handle them, and at the same time *their price* is important.

Various models of automatic injectors are used in veterinary practice for quick service of a large number of animals. They are designed to work in large pig farms, sheep farms, etc. (KERBL, 2020/2021, Agricultural Equipment and Supplies). They are handled quickly, but cannot be used for work with dangerous animals because they are short and the user is in close contact with the animals. An automatic injector pistol with an extension of up to 50 cm and glass container of the dart (KERBL, 2020/2021, Agricultural Equipment and Supplies), is also used. When used for treatment of bad-tempered or dangerous animals, there is a risk

that this distance may be inadequate for the safety of the operator if animals are not well restrained. There is also a risk posed by animals' natural response (biting or hitting) to the manipulation with the device. This could eventually result in breakdown of the partly protected glass container, injury of the animal from pieces of glass and damage of the expensive device.

Devices for delivery from a distance of remote injectors using compressed air are known. The available devices are a blowpipe, a pistol or a rifle for remote darts, with different range of action - from 5 m to 70 m - TeleInject, DanInject (<https://www.alfavet.bg>). Such devices can be operated from a sufficiently safe distance, but the remote injector may be damaged by the animal while attempting to get rid of it or be carried away by the animal so that it cannot be found when working in hunting farms and reserves.

The utility model refers to **remote piston injector for veterinary use - RPIVU** (Certificate for registration of a utility model No. 4182 U1/22.11.2021), (Figure 1). It can

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be used safely to apply different by type and importance applications related of animal health. It is a mobile tool providing treatment of dangerous animals with drugs, vaccines, etc. from a distance safe for humans, when using cheap disposable or remote syringes that are protected by the injector housing.

In connection with the investigation on the devices available on the market for safe, remote delivery of injections to dangerous animals and our own experience from the work with such animals (Mitev et al., 2009; Mihaylov et al., 2015a; Mihaylov et al., 2015b; Mihaylov et al., 2016; Certificate for registration of a utility model No. 4182 U1/22.11.2021) the following goal was set - to study the efficacy of a utility model of "remote piston injector for veterinary use".

Material and methods

Remote and ordinary syringes and a remote piston injector for veterinary use were used to administer 1 ml of saline solution to the lion (*Panthera leo*), red deer (*Cervus elaphus*) and brown bear (*Ursus arctos*) from Stara Zagora Zoo with the permission of its general manager and a number of cattle (*Bos taurus*) in the Farm animals clinic in the University Veterinary Hospital of the Veterinary Faculty at Trakia University, Stara Zagora, Bulgaria.



Figure 1. RPIVU prototypes – polypropylene tube (top) and metal tube (bottom)

Results and discussion

Very often when working with wild zoos, predators (lion, bear, wolf, etc.) or stray dogs, when sticking the needle with the remote syringe, the natural reaction of the animal is to bite the remote syringe into his body to remove it (Mitev et al., 2009). In such cases, the animal may injure itself from the syringe needle and render it unusable. Remote syringes are expensive. The complete set - syringe, needle, silicone needle tip and stabilizer are available on the market depending on their volume from 35 to 60 BGN (<https://www.alfavet.bg>), and their destruction is a resource cost.

To study the efficacy of the utility model, we allowed ourselves to inject 1 ml of saline to simulate a vaccine solution.

The injection of the lion (Figure 2) was excellent due to the proximity of the animal to the protective fence. As expected, the animal's natural reaction was to bite the syringe, but it was protected by the injector body.



Figure 2. Giving an injection to a lion (*Panthera leo*) by means of RPIVU (orig.)

Successful application was also obtained for red deer (Figure 3). Enticed by twigs from the Zoo's biologist, the animals approached a fence and we were able to „inject“ one of the animals. Their natural reaction after the injection was to run away, as seen in the photo, and they would have carried away the remote syringe if it had been fired with a pneumatic pistol.



Figure 3. Giving an injection to a red deer (*Cervus elaphus*) by means of RPIVU (orig.)

There were no difficulties in injecting the cattle (Figure 4) in the livestock crush.



Figure 4. Giving an injection to cattle (*Bos taurus*) by means of **RPIVU** (orig.)

However, when the bear was injected (Figure 5), it quickly pressed the injector with its front paws against the safety grille. Although we were able to inject the solution, we recommend using a metal injector housing for bears so that it is not destroyed by the animal's reaction.

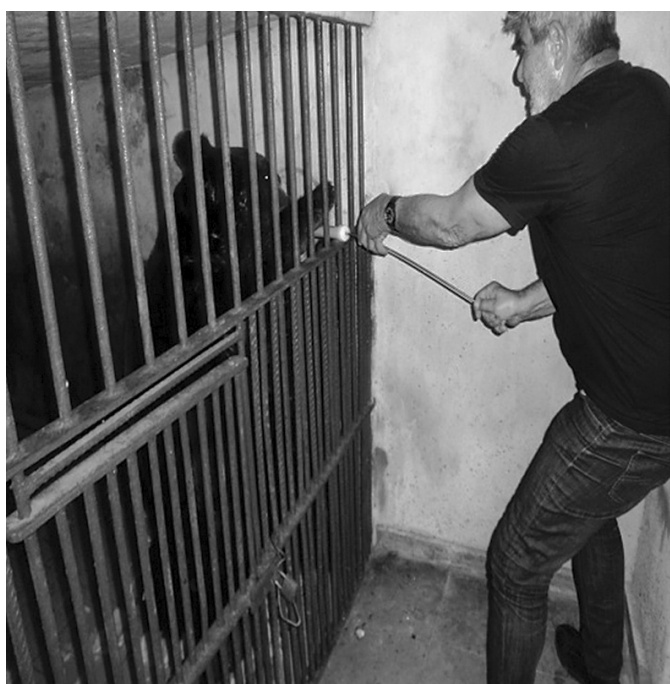


Figure 5. Giving an injection to a bear (*Ursus arctos*) by means of **RPIVU** (orig.)

We also recommend that when injecting bears with the injector, use a remote syringe in its housing for faster application of the drug and that the animal is not turned with its head towards the manipulator, but sideways or with its hind parts.

Conclusion

Based on the research, we found that utility model of **remote piston injector for veterinary use** is effective for the use of drugs in dangerous animals in zoos, etc. through a protective fence. When using it in such cases, a lower cost of consumables is achieved than the use of ordinary syringes and better preserving the integrity of the remote syringes!

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