Testing of different synthetic materials as capture equipment for zoo animals

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Introduction:

Whenever possible, appropriate (medical) training is preferable to the physical capture of animals under duress in everyday zoo routine. However, this is not always feasible and can also be retrieved in emergency situations. For this reason, hand-held nets are used for necessary capture operations for many animal species. However, problems arise again and again. In extreme cases, the capture situation can lead to stress myopathy and deaths in particularly sensitive species. A particularly noteworthy disturbing factor is the entanglement of the animals in the net material, which can lead to considerable stress, primarily for the animal but also for the user. There is an additional risk of injury to the animal and the catcher if an animal has to be freed from the net.

These problems can be alleviated by the use of special capture bags, which were developed in cooperation between Mr. Peter Prodromou and Mrs. Simone Karlowski / Zoo Dortmund.

Materials and Methods:

Starting in 2020, we successively developed various prototypes of capture bags that are suitable for catching birds, snakes, small to medium carnivores, small to medium primate species, crocodiles and other species.

For this purpose, various materials and specifications were processed. Nylon ripstop (coated and uncoated, 15-70den), polyester ripstop (coated and uncoated, 70g/sqm) as well as the robust and abrasion-resistant nylon fabric "Cordura®" in several material thicknesses were mainly used. The production of capture bags and matching frames was mostly done by hand. In addition, various extras such as locking mechanisms, viewing windows, ventilation surfaces, et. Incorporated, and checked for practicability.

The first step was mainly to test the different material thicknesses and specifications and to test different frame shapes. We were interested in the advantages and disadvantages of the materials compared to nets and which material or landing net shape is suitable for which animal species.

In addition, we worked on the possibilities of catching equipment for training use. There were two different fields for the training: on the one hand, we were interested in the extent to which it can be possible and useful to get animals used to voluntarily seeking out one of our catch bags. On the other hand, we also offered training opportunities for users of the trapping equipment in other zoos and institutions, such as wildlife authorities in different countries. Prototypes were also given to interested institutions, who were asked for feedback and suggestions for improvements to the equipment.

The tests took place in the context of necessary animal handling such as relocation actions, veterinary treatments, routine checks and in training situations, as mentioned above.

For the period from September 2020 to October 2023, we can prove several hundred capture operations on almost 60 different animal species. These include individuals of various mammal families such as primates (from pygmy marmosets to medium-sized species such as monkeys and baboons), small to medium-sized predators, articulated animals and large rodents, as well as bird species from the family of parrots, birds of prey, songbirds and waterfowl. A special focus was on reptiles; Particularly noteworthy are the trapping actions with a special bag (CrocMuzzle bag), with a total of 12 crocodile species. Other reptile applications have been found in animals of the iguana and monitor lizard families, tejus, giant snakes, snakes, elapid snakes and vipers.

Results:

When using our capture bags, there was no direct damage to the animal in any case. In a few cases, the materials used could not withstand the stresses and strains of use and the material specification and processing had to be continuously adapted accordingly.

It is striking that the captured animals almost always show a calmer behaviour within the bag than compared to the catch in a net net due to the visual shielding. There was also no more tangling of claws or limbs. In birds, the smooth surface of the material also achieves a significant improvement related to capture-related plumage damage.

Captured crocodiles showed a reduction in defensive rolling movements when using our CrocMuzzle bag, which is often observed when using rope nooses placed around the jaw. Due to the conical shape, the jaws are closed at the same time with capture and secured over a larger area. This increases safety for the user and protects the ISOs (Integumentary Sensory Organs) of the trapped animal by distributing pressure over a larger area.

Several animal species could be well accustomed to visiting the bag independently through positive associations and willingly allowing themselves to be locked up there for a certain period of time. This positive association could also be replicated after untrained and expected massive influences on the trapped animal (here: veterinary intervention by sedation, as well as in other cases the transfer to another enclosure).

The materials are easy to clean and wash and thus also meet the hygienic requirements for the professional and practical use of work equipment.

Discussion:

During the development and testing of the equipment, the application possibilities were limited by only a few occasions in oneplace. Accordingly, it was important to find other users and application locations. On the one hand, to increase the range of species to be captured, but on the other hand, also that of the people who use it.

In order to be able to achieve this, a high financial and time expenditure is required.

In general, we have made the experience that the acceptance and willingness to use new or different equipment sometimes causes difficulties. It is understandable that the physical capture of animals is sometimes seen and discussed controversially. Every now and then, however, it is necessary and here it should be carried out conscientiously and as gently as possible (physically and mentally). With the use of the materials we have used, we want to offer a sensible addition and not a replacement of the traditional materials.

In particular, we believe that the limited visibility of the trapped animal in the bag should be weighed against the advantages of visual shielding and the associated calming of the trapped animals, as well as the reduced risk of getting tangled in the material. We were able to improve this shortcoming by using bright ripstop materials that were as transparent as possible. Here, however, there is again a fine line to be walked between the aforementioned visual shielding and the improved visibility.

It is important to note that air permeability is not given with coated materials. For bags with these materials, we have incorporated extra ventilation surfaces. This must always be taken into account when applying.

The observations made regarding the calmer behaviour of the animals when using visually shielding materials have so far been based on a subjective assessment. Comparative evaluations, which systematically record and evaluate stress-related parameters, could be useful to reinforce this. Especially in animals suffering from capture myopathies, it would be desirable to check the blood lactate level in the course of comparisons of the traditional trapping method and the use of a capture bag.

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