Challenges in wildlife conservation: present and future perspectives

Desafios na conservação de vida selvagem: perspectivas presentes e futuras

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The global environment is under increasing pressure from expanding human activities and climate changes. The change in global environment, including increase environmental temperature, marine pollution, ocean acidification among others, has resulted in significant loss in biodiversity. To dates, the International Union for Conservation of Nature (IUCN) has estimated that 41% of amphibians, 33% of corals, 26% of mammals and 13% of birds are threatened by extinction (International Union for Conservation of Nature - IUCN, 2015). Imminent extinction of wild species is often caused by multiple factors and may not always be due to failure of animals to breed. Nevertheless, reproductive sciences play critical roles in wildlife conservation, especially captive breeding program. A clear example of how reproductive biology contributes to species recovery program is the case of black footed ferret (Howard et al., 2003; Santymire et al., 2014), endemic to North America. In 1980s, the species underwent severe population decline with only 18 individuals remained in the wild which were brought into captivity. To-date, >150 ferret kits have been produced by artificial insemination (AI), including offspring produced from frozen founder sperm stored for as long as 20 years. Since the inception of the captive breeding program, 8,000 black footed ferrets have been produced, half of which have been reintroduced into 20 sites in eight US States, Canada and Mexico.

Despite the success story of the black-footed ferret, the application of reproductive technologies to wildlife species is very limited. This is mostly due to the lack of basic knowledge on reproductive biology. As described in a review paper by Wildt et al. (2010), of 12,000 papers published in 10 leading reproductive journals, only 6% were dedicated to mammals (non-traditional species), 3% for fishes and <1% for amphibians, birds and reptiles. Without thorough understanding of reproductive biology, it will be very difficult to apply reproductive technologies to a given species on a regular basis. While there are some success in wild felids (Swanson, 2012), so far, there has not been a single example of embryo-based technologies being consistently utilized in species recovery program. More research on basic reproductive biology is needed for embryo technology can be incorporated into species recovery program.

Furthermore, mechanisms for reproduction are as diverse as animals are in physical appearance, genotype or geographic origin (Wildt et al, 2010). Examples of reproductive diversity have been recently reviewed for carnivores by Jewgenow and Songsasen (2014). Basically, reproductive mechanisms of animals within the same taxon are not always the same. For example, female maned wolves, unlike other canid species, require the presence of a male conspecific for ovulation to occur (Johnson et al., 2014). Ovulation induction in this species is believed to be regulated by chemical signals (Kester et al 2015). Because of the high diversity in reproductive mechanisms among species, ones cannot directly apply protocol developed from one species to another.

This presentation will provide an overview of global threats to wildlife, conservation challenges, specific examples of success and failure stories and future priorities for successful application of reproductive technologies to wildlife conservation.

Keywords: conservation, biodiversity and reproductive technologies, wildlife.
***Palavras-chave**: biodiversidade e tecnologias reprodutivas, conservação, vida selvagem.*

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