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Containment of hybrid wolf through surgical infertilization in Life Wolfalps EU project

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Introduction and aim

Anthropogenic hybridization is widely considered a threat to biodiversity conservation. Regarding wild wolves (Canis lupus), hybridization with domestic dogs is quite common in Europe and central Italy, while in the Alps, the phenomenon is potentially manageable due to the low number of cases, although timely intervention is necessary to control the presence of hybrid individuals. Traditional control procedures include culling or gonadectomy, but more recently, the interruption of genital pathways (infertilization) has been proposed. The opposition to the elimination of hybrids, due to public disapproval, is a clear issue that has been addressed by the scientific community. The Life Wolfalps EU project, approved by ISPRA, has also tackled this issue with action C5, providing guidelines for fertility control as proposed by CANC.

Methods

The infertility procedure was carried out by CANC and involves the interruption of the reproductive tract (vasectomy or salpingectomy).

Four hybrid wolves, two males and two females, were captured during three sessions (October 2022, April 2023, and October 2023). All subjects were premedicated with a mixture of tiletamine and zolazepam (Zoletil 100®, 50/50 mg/ml, Virbac S.r.l, Milan) at 8.7 mg/kg i.m., and induction was performed with intravenous administration of Propofol (Proposure®, 10 mg/ml, Boehringer Ingelheim Animal Health Italy S.p.a) at 2.5 mg/kg. Maintenance was performed with isoflurane via a tube in pure oxygen, and during the entire procedure, the animal remained connected to a multiparametric monitor (Infinity Delta®, Dräger Italia S.p.A., Corsico, Italy) for intraoperative monitoring of vital signs.

In male subjects, a laparotomic vasectomy was performed due to its minimal invasiveness and very short execution time with intradermal suturing at very close intervals. In the two females, the minimally invasive method of salpingectomy was opted for, involving the opening of three 3-5 mm surgical breaches, which then healed by second intention without the application of sutures. The intervention time was longer compared to the laparotomic technique, but the reduced invasiveness allowed for quicker post-surgical recovery and faster release.

At the end of the intervention, 8 mg/kg cefovecin (Convenia®, Zoetis Italia S.r.l., Rome) were administered to ensure two weeks of antibiotic coverage; analgesia was provided subcutaneously with Carprofen (Rimadyl®, Zoetis Italia S.r.l., Rome). The males, equipped with a GPS collar positioned during anesthesia, were released in the center of the pack's territory within three hours of awakening and reunited with the other members without being attacked or expelled. The two females are housed in captivity at the "Uomini e Lupi" center in Entracque (CN – Italy) for monitoring of sexual hormone patterns following the salpingectomy.

Discussion and conclusions

Surgical fertility control as an alternative to euthanasia is considered an acceptable method by the public for managing wild animal populations. Since wolves exhibit significant social and hierarchical characteristics induced by hormones, the depletion of hormonal stimuli following gonadectomy would cause a profound alteration in pack behavior. Therefore, orchiectomy and ovariectomy are not considered appropriate methods. On the other hand, the interruption of the reproductive tract, preserving the gonads, allows for the control of the fertility of captured subjects without altering their behavioral characteristics, as confirmed by their return to the packs. Complications, especially in females such as paraovarian cysts reported in older domestic dogs, need to be verified. Since the results of this initial phase of the project were encouraging, further capture sessions will be planned for the management of hybrids through infertility.

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