

I. Title and abstract

Title: Diclofenac and other non-steroidal anti-inflammatory drugs (ketoprofen, carprofen, flunixin) in avian scavengers in the Iberian Peninsula.

Rationale: Diclofenac is a non-steroidal anti-inflammatory drug (NSAID) for veterinary use that has caused catastrophic levels of mortality of vultures that consume livestock carcasses treated with it. Although strict veterinary regulations exist in Europe, the licensing and use of this drug in several countries poses serious concerns for vulture health and the important ecosystem services they provide. This could be especially pronounced in the Iberian Peninsula, which holds 95% of Europe's vulture population.

Hypothesis/Objectives: We hypothesize that avian scavengers in the Iberian Peninsula are at risk of exposure to diclofenac (and other NSAIDs: ketoprofen, carprofen, flunixin) through medicated domestic animals scavenged and provided to them at feeding stations.

The overall aim of this study is to investigate the exposure of four vulture species: Eurasian griffon vulture (*Gyps fulvus*), cinereous vulture (*Aegypius monachus*), bearded vulture (*Gypaetus barbatus*), and Egyptian vulture (*Neophron percnopterus*), to NSAIDs in the Iberian Peninsula with particular focus on vulture feeding stations. The specific objectives are:

- To identify the scope of diclofenac and other NSAIDs (ketoprofen, carprofen and flunixin) use in livestock in the Iberian Peninsula.
- To evaluate diclofenac and other NSAIDs (ketoprofen, carprofen and flunixin) residues, as well as multiorgan histopathological assessment, in avian scavenger carcasses.
- To evaluate diclofenac and other NSAIDs (ketoprofen, carprofen and flunixin) residues in domestic animal carcasses provided at vulture feeding stations.

Study Design: Surveys to livestock veterinarians will be used to estimate the scope of diclofenac and other NSAIDs use in the livestock throughout Spain and Portugal, and evaluate knowledge levels around the risk presented to avian scavengers by this use. Liver and kidney samples from the four species of vultures of concern will be obtained from necropsies performed at rehabilitation centers and wildlife hospitals in Spain and Portugal. Multi-organ histopathological evaluation will be done when possible. Based on past reports, it is estimated that more than 100 samples per year from griffon vulture will be obtained. From the other 3 species, we estimate that about 20 cinereous vultures, five Egyptian vultures and two bearded vultures per year can be obtained. Vulture feeding stations across Spain and Portugal will be selected and kidney, liver and skeletal muscle samples will be obtained from carcasses intended for feeding and analyzed for NSAIDs. Once the data is being collected, a risk analysis will be developed to estimate the risk of exposure to diclofenac and other NSAIDs of the avian scavenger populations in the Iberian Peninsula.

Preliminary Data: Three Asian vulture species have become critically endangered because of acute toxicity following consumption of the carcasses of diclofenac-treated livestock, with over 95% of *Gyps* vultures dying from kidney failure caused by ingestion of this drug (Oaks et al., 2004). Experimental exposure trials indicated that vultures are extremely sensitive to the toxic effects of diclofenac (Swan et al., 2006).

Expected results: We expect veterinarians are using diclofenac in livestock throughout Spain and Portugal and that they have little information about the risks that treated carcasses pose to scavengers. We also expect diclofenac residues in avian scavenger carcasses and in their food sources at feeding stations.

Potential Impact for Animal Health: These results will inform Spanish national veterinary authorities and be used by decision-makers who regulate diclofenac. Potentially, it may lead to a ban on the use of diclofenac, as many Asian countries have done since 2006. These measures will avoid the threat of extinction of avian scavenger species due to diclofenac's high toxicity to vultures and the associated loss of biodiversity. The use of other widely available alternative drugs that are known to be safe for vultures and other scavengers could be encouraged.

III. Name, Institution, and email address

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the IUCN – The World Conservation Union whsg@ecohealthalliance.org
Co-chair – Prof Richard Kock rkock@rvc.ac.uk

Wednesday, 12 November 2014

TO WHOM IT MAY CONCERN

Ref Application Ignacio Marco Sanchez UAB Ignasi.Marco@uab.cat
Morris Animal Foundation Call November 2014

Dear Sir Madam

The IUCN SSC Wildlife Health Specialist Group would like to give its unequivocal support to the initiative presented by Dr Sanchez for funding to MAF, given the urgency of the matter, and in terms of current discussions pending at the European Medicines Authority with respect to diclofenac licencing.

IUCN Director General recently raised the alarm on attempts to licence the use of diclofenac, a non-steroidal anti-inflammatory drug, in veterinary medicine in EU member states, despite unequivocal evidence of the massive harm this drug use, in animals, has caused to populations of *Gyps* vultures and probably many other scavenging raptors in South Asia. One reason that this issue has managed to reach the stage it has in Europe, is a lack of evidence on risk of the drug use in the European context. I believe evidence of its potential harm to the European raptor population exists but needs to be reinforced by such studies, to prevent a potential catastrophe on these already low populations, under critical extinction pressure in Eurasia.

If you have any queries on specifics please contact us directly.

Sincerely

Richard Kock
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UNIVERSITY OF MINNESOTA

THE RAPTOR CENTER

*To ensure the
health of raptors
and the world we
share through
teaching,
research, and
service.*

14 November 2014

Morris Animal Foundation Review Committee

Dear Committee Members:

Please accept this letter of support and collaboration for the proposal submission by Ignasi Marco (Servei d'Ecopatologia de Fauna Salvatge (SEFaS) (Wildlife Health Research Group), Departament de Medicina i Cirurgia Animals, Universitat Autònoma de Barcelona).

This proposal addresses an important conservation question in understanding the risk of diclofenac exposure to vultures whose populations are already at risk. Spain, home to a large percentage of the European vulture population, is a critical and uniquely positioned location for addressing this question. The combination of veterinary use of diclofenac and the practice of providing vulture-feeding stations as a conservation measure to support the populations may be creating a situation that is in direct contrast to the conservation principles, values and practices desired.

Should this proposal be funded, The Raptor Center at the University of Minnesota agrees to follow all protocols pertaining to this study. In my personal role as a wildlife veterinarian and researcher studying raptor health issues (individual and population level), I have helped identify the questions to be addressed by this project as key information needed for decision-makers, policy-makers and conservationists to meet their goals of conserving vulture populations. In addition, as part of our commitment to this proposal, we will provide and oversee the graduate research assistant (student) who will perform the risk assessment identified as one of the objectives.

Sincerely,

Julia B. Ponder, DVM
Executive Director

Zurich, 18 November 2014

Support letter for Project from Wildlife Diseases Research Group at the Universitat Autònoma de Barcelona to sample diclofenac and other NSAIDs in dead vultures and in animal parts made available for vultures in the Iberian peninsula

Dear Sir/Madam,

The Vulture Conservation Foundation is the leading European organisation working on the conservation of the 4 European vulture species. Among others, we are coordinating or co-coordinating the projects reintroducing bearded vultures in the Alps, Grands Causses (France) and Andalusia (Spain), and we are also working on the reintroduction of black vultures in France and of griffon vultures in Bulgaria.

We have been at the forefront of the complex policy and advocacy campaign to ban veterinary diclofenac (a Non-Steroid Anti-Inflammatory Drug, NSAID) in the EU ever since we got the news last year that this anti-inflammatory drug had been approved for sale in Spain - a key country for vultures in Europe and the world. See <http://www.4vultures.org/our-work/campaigning-to-ban-diclofenac-in-europe/> for a summary of the work of the VCF in this area. We have been lobbying the EU Commission and the European Medicines Agency (EMA) to ban veterinary diclofenac, promoted and contributed to many press stories on the subject published by many of Europe's reference press outlets, and worked with scientists and researchers on this issue, resulting in articles and editorials in journals like Nature, Science, Conservation Biology and others.

We have also recently contributed a reasoned opinion to the public consultation organised by the EMA, as part of the EU's own review process regarding the issue, and continue to work with other conservation organisations, governments, universities and other stakeholders on this matter.

One key aspect on this issue has been and will be the patterns and level of use of the veterinary drug in Spain, and how and when it may reach the vulture feeding chain. Sampling dead vultures for potential diclofenac residues, and sampling of animal parts entering the vulture food chain through feeding stations or the wider countryside is therefore an immediate priority, so that we can document and quantify the level of risk this drug poses to vultures in Europe.

The VCF believes that current livestock and veterinary practices in countries like Spain do not eliminate the risk to vultures to an acceptable level - mostly because it is impossible to isolate and control every diclofenac-treated animal, and prevent it from entering the vulture food chains. Animals that die in the fields in extensive livestock regimes are now allowed to be left for vultures – these often find the carcass much earlier than the livestock farmer!-, and vulture feeding stations across the Iberian Peninsula receive thousands of kilos of animal

carcasses and animal subproducts every week, often from intensive explorations. Recently published evidence suggests that a griffon vulture was poisoned with another NSAID (flunixin) in Andalucía, and we believe it is only a matter of time before vultures start dying because of veterinary diclofenac.

We thus welcome very much, and fully support, any project that aims to quantify and diagnostic diclofenac residues both in dead vultures and in carcasses made available to vultures. This type of data is essential to quantify and establish the level of risk posed by the legal availability of veterinary diclofenac, and thus contribute to the debate on the best regulatory decision to deal with this threat to vultures. We hope this project, led by the Wildlife Diseases Research Group at the Universitat Autònoma de Barcelona (Spain) or projects like this, will contribute badly needed data to inform future decisions.

Yours sincerely,



Dr. José Tavares

Director

Vulture Conservation Foundation VCF

Tuesday, 18 November 2014

Dear Sir, Madam

On behalf of BirdLife International Europe, we would like to recommend the project “Diclofenac and other non-steroidal anti-inflammatory drugs (ketoprofen, carprofen, flunixin) in avian scavengers in the Iberian Peninsula” for funding under your grant scheme.

Europe is probably the only remaining region in the “old world” where Vultures are on the increase (with the exception of the Egyptian vulture). *Diclofenac* and other NSAID drugs were responsible for the massive declines of vulture species in SE Asia, and populations will need decades to get back to their original sizes. African vultures are also declining; causes are still not entirely clear, but again poisoning and vulture-parts trafficking seem to be the main drivers.

Ever since we were aware of the commercial authorisation of veterinary *diclofenac* in Europe (late 2013) BirdLife International has coordinated an international campaign to ban this NSAID in Europe¹. We will not wait until *diclofenac* starts killing vultures or it might be too late. Besides, new scientific evidence suggests *diclofenac* is not only toxic for vulture but for eagles and other necrophagous bird species².

We believe projects such as this one are urgently needed and will only help us in our fight to understand, quantify and prevent, the current exposure levels of this toxic drug in Spain. We plan to closely monitor the development and implementation of this project, and we kindly ask you to support this very interesting initiative.

On behalf of BirdLife International Europe



Iván Ramírez

Head of conservation for Europe and Central Asia

¹ <http://www.birdlife.org/europe-and-central-asia/project/ban-veterinary-diclofenac-now>

² http://www.birdlife.org/sites/default/files/attachments/20140527PR_DiclofenacKillsEagles.pdf