The illegal use of poison in Portugal and the link between the health of wildlife, human beings, domestic animals and ecosystems

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Introduction

Poisoning is currently one of the **greatest threats** to numerous **wild species**, many of them with high conservation status, such as the Iberian imperial eagle, vultures, Iberian wolf and Iberian lynx. This **illegal practice** also **affects domestic animals** directly and may even **affect humans**.

The use of poisons is **often associated with game and agricultural activities**, but **conflicts between people** are also the source of many cases of poisoning; the use of poisons is also frequent in **rodents and wild birds control**.

The **ease with which chemical products can be acquired and applied** combined with the **number of individuals it can affect and its non-selectivity**, makes poison use **unpredictable and with uncontrollable consequences**. Once toxic substances **enter the food chains**, it can take on **uncontrollable proportions** that might even reach humans and domestic animals and, thus, constitutes a **serious public health problem**. The risk of soil contamination, water and even food crops exists since some toxics can remain in the environment for long periods at doses high enough to be dangerous.

Methods

Within LIFE Imperial Project (LIFE13 NAT/PT/001300), in order to assess the illegal use of poison in Portugal, we collected information about cases of possible poisoning from 3 different data sources (PAP - Programa Antídoto Portugal (2003-2014), three wildlife recovery centers (2010-2015) and GNR - Guarda Nacional Republicana (2013-2015)). Data were organized and processed using the Microsoft Office Excel tools.

Results

It were collected **over five hundred cases of possible poisoning** affecting **domestic and wild species**.

The percentage of **domestic animals** poisoned ranged between **7% and 81% of the cases**, depending on the data source. The higher number of domestic animals identified by PAP (nationwide; figure 1a) is probably related with the ease of missing and finding them, compared to the wild ones.

Depending on the data source, between **81% and 97%** of the animals **were found dead** (figure 1b), which proves the fulminant impact of this threat.

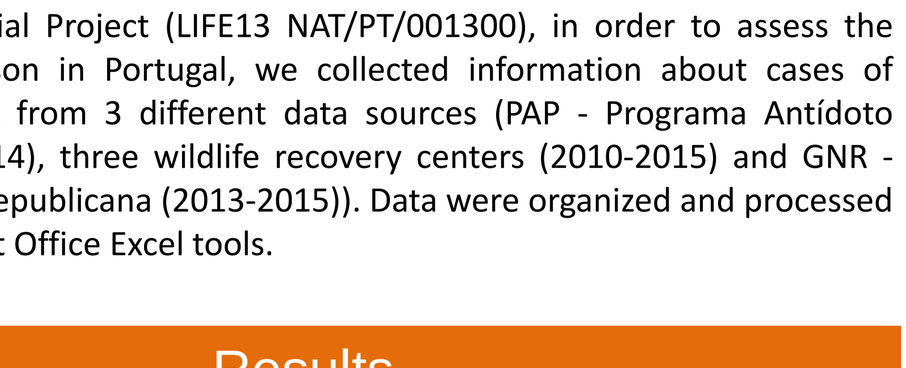


Figure 1a: Percentage of individuals of wild species and domestic animals affected in possible poisoning cases (PAP; 2003-2014; n=1587). The wild animals included 12% of protected species and 7% of game species.
Figure 1b: Condition of individuals found (PAP; 2003-2014; n=1593)

Results (cont.)

The **wild animals found belong to 33 protected species**, including **4 *Critically endangered* species**, and **10 game species**.

The **griffon vulture**, the **red kite** and the **Iberian wolf** were identified as the 3 protected species with higher number of individuals affected by possible poisoning (figure 2).

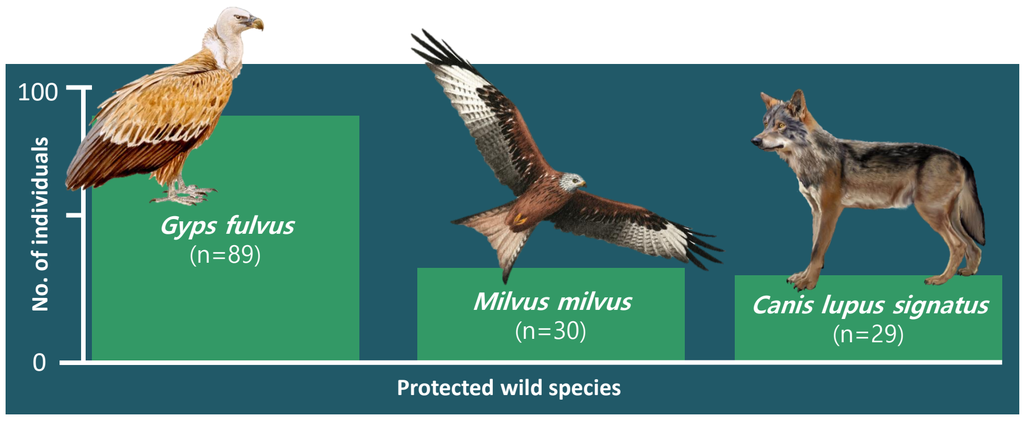


Figure 2: Protected species with higher number of individuals affected by possible poisoning (PAP; 1992-2014)

The data suggested that the use of poison is **wide spread across Portugal** with a higher incidence of cases in the **interior, Centre and North** of the country (figure 3). These "red" districts have a large diversity of wild animals, sustaining this way some of the motivations for poison use.

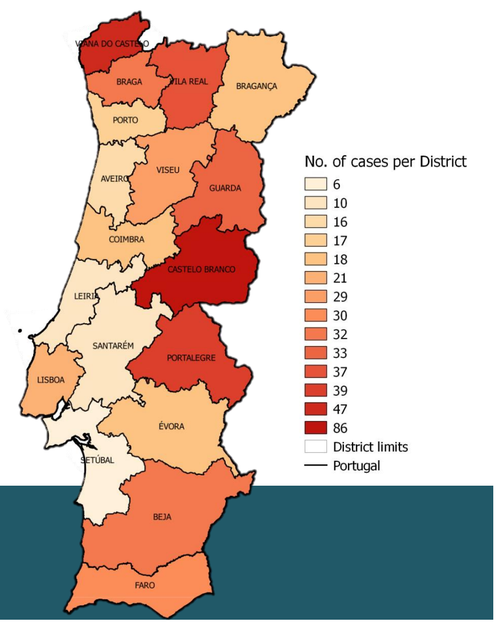
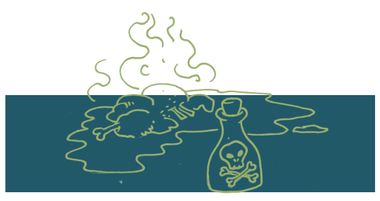


Figure 3: National distribution, per district, of the possible poisoning cases (PAP; 2003-2014; n=499)

The **poisoned baits** used to attract animals were very diverse and included different types of **meat, dog food or fish**. This indicates the species for which they are usually intended and shows the ease they can be eaten by domestic animals or touched by people.



The **poison substances** used included Carbamates, rodenticides, Organophosphorates, Organochlorides or strychnine, some of which of **illegal sale** and others of **common use**.

Discussion

Poisoning is a real threat in Portugal, not only for wildlife and domestic animals, but also for people. **Wildlife mortality works as "sentinel"** for larger environmental contamination with consequences on the **entire ecosystem**, including **humans** and **domestic animals**. Therefore, monitoring the illegal use of poisons should be enhanced in an **integrated "One Health" perspective** in order to correctly evaluate and **minimize the impact of this illegal practice on public health, wildlife and ecosystems**.

Illustrations: Davina Falcão (*A. adalberti* and GNR team), Juan Varela (*G. fulvus*), Marcos Oliveira (*M. milvus*), Heriander Martins (*C. lupus signatus*), Paulo Alves (poison bottle and bait)

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