

Research trends on wolves in Portugal: a bibliometric analysis and context of a large carnivore in the carnivore community.

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INTRODUCTION

Updated information regarding research trends and distribution of species at a regional scale is **crucial for an effective management and conservation**.

However, available **data is often biased** towards certain species or regions, depending mostly on their biological traits, as well as on conservation and management interests. Moreover, when examining the information available for certain taxa, **discrepancies emerge in relation to the reliability** and the spatio-temporal coverage of **research efforts**.

GOAL: Review the scientific literature and evaluate the research trends regarding the wolf in the context of the mammalian terrestrial carnivore community in Portugal, currently composed by 15 species.



MATERIAL AND METHODS

Comprehensive review of the scientific literature in Portugal

Compilation of publications from several sources:

- Search engines
- Universities archives



Analysis of several publication metrics

- Date of publication
- Type of publication
- Research topic
- Focus on one or more species
- Focus on the entire Portuguese range vs. the two subpopulations north and south of Douro River.

Compilation of presence records for the 21st century

Sources:

- Literature review
- Online databases
- Privately owned unpublished data

Information:

- Date
- Type (reliability)
- Geographical location

REFERENCES

- Baptista MD (1789) Faunae Conimbricensis Rudimentum. Coimbra, Portugal.
Pimenta V, Barroso I, Álvares F, Correia J, Ferrão da Costa G, Moreira L et al. (2005) Situação Populacional do Lobo em Portugal: resultados do Censo Nacional 2002/2003. Instituto da Conservação da Natureza/Gurpo Lobo, Lisbon, Portugal.

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RESULTS

Bibliometric analysis

The wolf is currently the **Portuguese carnivore species with the highest number of publications** (N=260, 34% of total number of publications focusing on carnivore species in Portugal).

Scientific research on wolves in Portugal:

- Began in the **18th century** (Batista, 1789), with a **boost in the mid-1990s** (Fig. 1)
- It has been published mostly through **Conference Proceedings, Theses** and **non-SCI Journals** (Fig. 2)

Most of the studies referring the wolf, **90%, are dedicated exclusively to this species** (Fig. 3).

Considering all Portuguese range and the two subpopulations located at north and south of Douro River separately, the topic of **Conservation has been the main focus of research in general**.

Health Status has been the less studied topic in the Southern subpopulation.

Genetics and other areas have also been the least studied topics in each individual subpopulation.

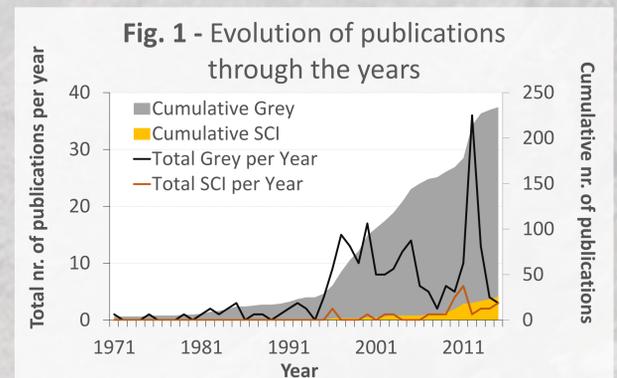


Fig. 2 Type of publication

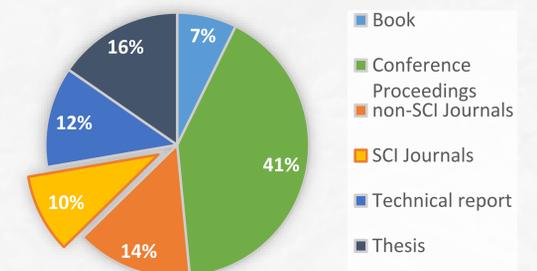


Fig. 3 Focus area of the publications

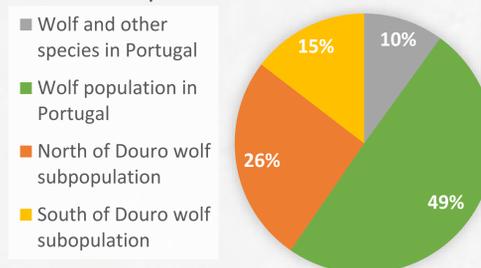
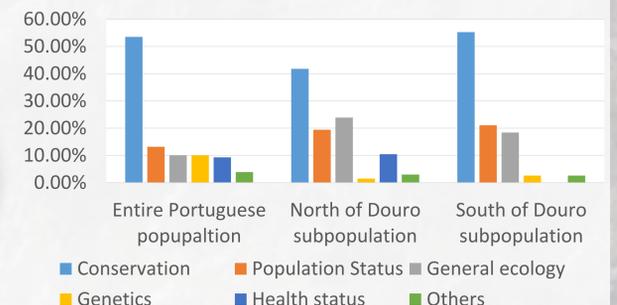


Fig. 4 Research topic



Compilation of presence records

- **589 presence records** compiled for wolves in Portugal since 2000
- The ratio regarding spatial resolution was **76% records at the scale of 10x10km** (UTM) and 34% with precise GPS locations
- **Records of all types** (live and dead animals, photos and videos, presence signs, telemetry and vocalisations).
- **43% of the records confirmed and reliable** vs. 57% unconfirmed records.

The wolf is one of the few carnivore species in Portugal for which there is a **recent national survey with systematic sampling** (Pimenta et al., 2005).

Record sources:

- 19% - national wolf survey
- 8% - other publications
- 35% - online databases, such as SIPNAT
- 38% - unpublished data from several researchers and institutions

CONCLUSIONS

This study reveals the research trends associated with wolves at a national level and puts in evidence the importance researchers have given to study this particular threatened species.

Recommendations for future research on this species include:

- **Focusing on poorly known research issues**, such as health status (diseases) and genetics
- **Further sampling to collect more confirmed records** (e.g. scats genetically validated), particularly in the NE region of Portugal.

Further contact

If you have any records of carnivores in Portugal and you would like to give your contribution to the construction of a database of presence records of mammalian carnivores in Portugal, please send your data or clarify any doubts through the contact: jubencas@gmail.com