



# GLOBAL EPIDEMIOLOGY OF TAENIA MULTICEPS: A COMPARATIVE META-ANALYSIS STUDY

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## Introduction

- The cestode “*Taenia multiceps*” utilizes various canids as definitive hosts and a wide range of ungulates as intermediate hosts, and can circulate in both domestic and sylvatic cycles, the most common of which is the dog-sheep cycle
- The parasite can cause serious losses in the sheep industry, and has a zoonotic impact
- A great debate has been raised whether CNS and non-CNS located coenuri belong to the same parasite species
- Nevertheless, the published data are rather fragmentary and the link between the occurrence of the disease in definitive and intermediate hosts in most countries is missing, leaving a large gap in the epidemiology of this parasite and underlines the need for further analyses.

## Objectives

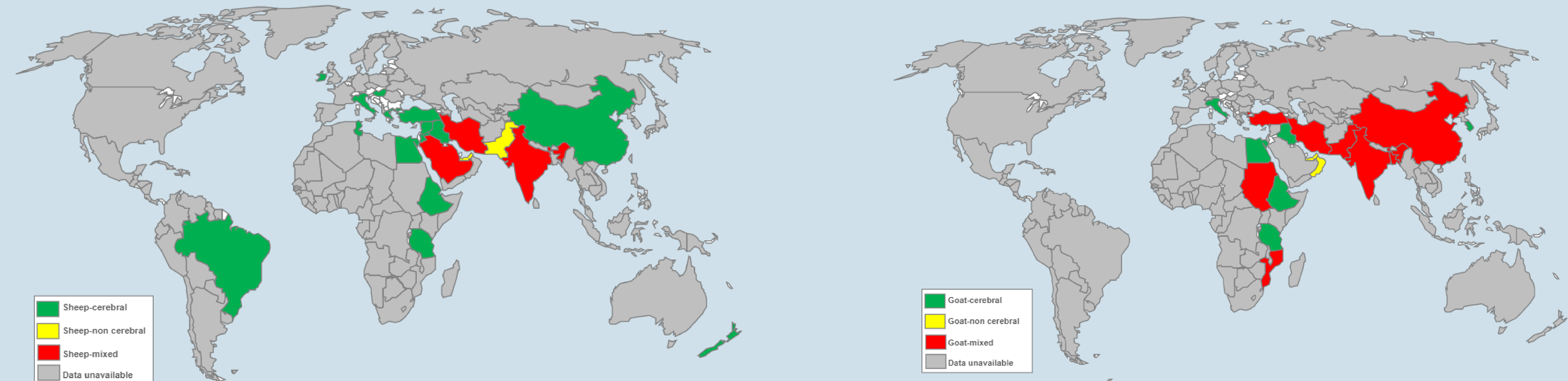
- The present paper provides the first meta-analysis for the published data from various definitive and intermediate hosts worldwide, aiming at better understanding of the global epidemiology of this ubiquitous taeniid.

## Methodology

- The databases PubMed, Scopus Science Direct and Google Scholar were searched using the following key terms in various combinations; *Taenia multiceps*, *Coenurus cerebralis*, *Coenurus gaigeri*, dog, sheep, goat, cattle and wild animals.
- Studies were considered eligible if they had found positive samples for adult or larval stage of *T. multiceps*.
- The organized data in the Excel spreadsheets were used for the meta-analysis, employing the software Open Meta[Analyst]
- All analyses were conducted based on a 95% confidence interval.

## Results

- ✓ Most of surveys came from the African, Eastern Mediterranean and European countries.
- ✓ For definitive hosts, 11,191 dogs have been sampled worldwide with a pooled prevalence of 5.8% (4.7 – 6.9%), based on 95% confidence interval. There is a lack in surveys on dogs from some endemic areas (e.g., Sardinia, Italy).
- ✓ The highest prevalence was estimated for grey wolves (21.6%, 15.7 – 27.5%) and the least (2.7%, 1.5 – 3.9%) was for foxes.
- ✓ The intermediate hosts typically carry the larval stage “*Coenurus cerebralis*” in the central nervous system (CNS). Few reports that came from some African and Eastern Mediterranean countries, have documented extra-CNS coenuri in sheep and goats.
- ✓ Based on slaughterhouse surveys, sheep had a higher CNS-coenuri prevalence (8.8%, 7.3 – 10.3%) than goats (5.8%, 4.0 – 7.6%), but the extra-CNS coenuri were frequently detected in goats (0.3%, 0.2 – 0.4%) more than in sheep (0.0%, 0.0 - 0.1%). In either case, the difference was statistically insignificant between sheep and goats.
- ✓ Brains of infected animals mostly had a single coenurus that located in the cerebrum, with no statistical difference between the right and left cerebral hemispheres.
- ✓ Economically, *T. multiceps* coenurosis was detected in more than half (~ 53%) of sheep cases with neurological symptoms; this is alarming and emphasizes the importance of developing effective control strategies in the endemic areas



▪ Figure 1. World geographical distribution of cerebral and non-cerebral coenurosis in sheep.

▪ Figure 2. World geographical distribution of cerebral and non-cerebral coenurosis in goats.

## Meta-analysis data

- Seventy-four studies comprising 84 data sets from 32 countries have described the prevalence in various canids (dogs, foxes, wolves and jackals), whereas 80 studies comprising 171 data sets from 44 countries have determined the prevalence in sheep and goats. Data from a total of 397,189 animals consisting of 11,191 dogs, 2,898 foxes, 1,103 wolves, 718 golden jackals, 183,499 slaughtered sheep, 123,270 slaughtered goats, 55,340 live sheep and 19,170 live goats were included to estimate the global prevalence.