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Conference Abstract

Health and zoonotic pathogens surveillance of invasive snakes: A One-Health approach

Jairo Alfonso Mendoza-Roldan[‡], Gianpaolo Montinaro[‡,§], Mario Alves[‡], Domenico Otranto[‡,|]

‡ Department of Veterinary Medicine, University of Bari, Valenzano, Italy
§ Rifcon GmbH, Hirschberg, Germany
| Department of Veterinary Clinical Sciences, City University of Hong Kong, Hong Kong, Hong Kong

Corresponding author: Jairo Alfonso Mendoza-Roldan (jairo.mendozaroldan@uniba.it)

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Abstract

Invasive alien snakes pose an increasing ecological and sanitary risk, being potential reservoirs and dispersers of pathogens that can affect wildlife, domestic animals, and humans. As biological invasions accelerate due to globalization and the exotic pet trade, the epidemiological role of non-native species has come under increased investigation. Recent epidemiological research of established populations—such as Burmese pythons (*Python bivittatus*) in the Greater Everglades ecosystem and California kingsnakes (*Lampropeltis californiae*) in Gran Canaria—have identified a wide and alarming diversity of microorganisms of significant zoonotic concern.

Current literature extensively highlights the high prevalence of zoonotic enteric bacteria in these invasive predators. Most notably, invasive snakes frequently harbor multi-drug resistant (MDR) strains of *Salmonella enterica*, posing a severe public health risk via direct handling or the contamination of shared environments. Alongside *Salmonella*, studies have identified these reptiles as shedding sources for *Campylobacter* spp., *Yersinia enterocolitica*, *Pseudomonas aeruginosa*, and *Escherichia coli*. Furthermore, the recent detection of the emerging, multi-drug resistant fungal pathogen *Candidozyma auris*) in reptilian hosts raises critical alarms regarding the potential for wildlife to serve as environmental maintenance reservoirs for urgent global human health threats.

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Beyond bacterial and fungal agents, invasive snakes are potent dispersers of zoonotic parasites and vectors. Recent ecological health assessments underscore the introduction and rapid spillover of novel parasites, such as the respiratory pentastomid *Raillietiella orientalis* from Burmese pythons to native herpetofauna, carrying broader implications for zoonotic visceral pentastomiasis. The gastrointestinal tracts of these invaders also frequently shed zoonotic protozoa (including *Cryptosporidium* and *Entamoeba* species) and helminths (oxyurids, ascarids), which can contaminate local watersheds. Additionally, non-native snakes introduce and sustain exotic ectoparasites, such as non-endemic ticks, which can act as competent vectors for rickettsial and other blood-borne pathogens affecting human and veterinary health.

These findings collectively emphasize the profound capacity of invasive snakes to introduce novel pathogens, amplify endemic disease cycles, or facilitate bidirectional spillover events within native ecosystems. To mitigate these multifaceted risks, a One-Health framework is essential. By integrating active wildlife health assessments, advanced genomic sequencing, environmental DNA (eDNA) monitoring, and public-health surveillance, this approach enables the early identification of emerging zoonotic threats. Ultimately, systematic and cross-disciplinary monitoring represents a critical preventive tool to safeguard global biodiversity, prevent the establishment of novel pathogens in naïve ecosystems, and formulate evidence-based mitigation strategies to reduce exposure risks for both humans and animals.

Keywords

Parasitic Zoonoses, Host-Parasite Dynamics, Veterinary Public Health, Vector Ecology, Bioindicators

Presenting author

Jairo A. Mendoza-Roldan

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Conflicts of interest

The authors have declared that no competing interests exist.