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Conference Report

Abstracts of the 3rd International Electronic Conference on Microbiology †

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Abstract

The current proceedings summarize the presentations delivered during the third International Electronic Conference on Microbiology (ECM 2025), which was held online from 1 to 3 April 2025, via the SciForum platform. This virtual event brought together researchers from around the world to share recent advances in microbiological sciences. The ECM 2025 highlighted recent developments across a broad spectrum of microbiological research, including antimicrobial resistance, gut microbiota, infectious diseases, and environmental microbiomes. Participants shared their work through online presentations and abstracts, with selected submissions invited for full publication. The event fostered global collaboration, promoted open-access science, and showcased innovative tools for studying and managing microbial systems in health, agriculture, and industry. The multidisciplinary program was organized into several thematic sessions: S1. Gut Microbiota and Health Disease. S2. Foodborne Pathogens and Food Safety. S3. Antimicrobial Agents and Resistance. S4. Emerging Infectious Diseases. S5. Microbiome and Soil Science. S6. Microbial Characterization and Bioprocess. S7. Microbe–Plant Interactions. This conference report presents summaries of the contributions made by participating authors over the three-day event.

Keywords: gut microbiota; foodborne pathogens; food safety; antimicrobial agents; infectious diseases; microbiome; microbial characterization; bioprocess; microbe interactions

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1. Session: Gut Microbiota and Health Disease

1.1. Dissemination of Enterococcus spp. *Across One Health Settings: Insights from Fingerprinting Analysis*

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the selection of candidates and supports the development of targeted antibacterial agents. This can speed up the discovery process and reduce costs in the ongoing fight against antimicrobial resistance.

Methods: The pharmacokinetic properties of thymoquinone and its pharmacological potential and bioavailability were computationally evaluated using the SwissADME tool. The topologies of the receptor proteins were analyzed using the CASTp web server, and triple molecular docking simulations were performed using AutoDock Vina 1.1.2. Molecular visualization and analysis were performed with PyMol and DS Visualizer

Results: Thymoquinone fulfills all of Lipinski's rules of five criteria, which indicates favorable pharmacokinetic properties for potential therapeutic use. Molecular docking simulations show a strong binding affinity to the MvfR protein in *P. aeruginosa*, which is an important regulator of virulence and quorum sensing. Seven (out of nine) models showed consistent interactions with a root mean square deviation (RMSD) of less than 5 Å, often involving the amino acid Ile236.

Conclusions: Computational chemistry can enhance the development of new antibiotics. Thymoquinone shows favorable pharmacokinetics and a strong binding affinity to the MvfR protein in *P. aeruginosa*. Thymoquinone shows potential as an antimicrobial agent against *P. aeruginosa*, but further in vitro and in vivo tests, including toxicological studies, are needed to evaluate its cytotoxicity.

3.23. Use of Medicinal Plants for Treatment and Prophylaxis of Canine Parasitic Infections: A Literature Review

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Introduction: Dogs have been perceived as providing companionship to all members of the family, yet they can act as a vector for the transmission of parasitic agents to humans, particularly those who own or care for them. Traditional medicine seem to demonstrate effects in the treatment of diseases in animals; however, it is necessary to prove their effectiveness using more recent scientific evidence.

Objective: The objective is to identify medicinal plants commonly used in the treatment and prophylaxis of parasitic infections in dogs.

Methods: A literature review was conducted by gathering data from the MEDLINE database, using the following search equations: "("Plants"[Mesh] OR ("Plants/parasitology" [Mesh]) AND ("Phytotherapy/veterinary"[Mesh])"; "Medicinal Plants Treatment for Infested Dogs"; "Parasitic Infections in Dogs Treatment with Plants". The selection criteria established ensured that only articles published between 2000 and 2023, which referenced the utilization of medicinal plants in the management and prevention of parasitic infections in canines, were included. Furthermore, review articles and articles that referenced pharmacological treatments or treatments for other comorbidities were excluded.

Discussion and Conclusions: A total of 26 articles were selected, resulting in the identification of 112 species from 16 countries that can be used to treat or prevent infections and parasitic infestations. The most commonly used medicinal plants were: *Azadirachta indica*, *Juniperus communis* L., *Melissa officinalis*, *Clibadium surinamense* L., *Olea europaea* L., *Juglans regia* L., *Allium sativum* L., *Coriandrum sativum* L., *Artemisia cina* Berg ex Poljakov, *Calendula officinalis* L., *Mentha piperita* L., *Cocos nucífera* L., *Ricinus communis* L., *Andrographis paniculata* (Burm.f.) Wall. ex Nees and *Juglans nigra* L. The species in question contain a variety of compounds that may confer medicinal properties; however, the anthelmintic

and anti-parasitic activity may be attributed to the presence of phenolic compounds, which are known to possess a range of beneficial properties, including anti-parasitic and anthelmintic effects.

4. Session: Emerging Infectious Diseases

4.1. Influence of Non-Treatment of Partners on the Rate of Congenital syphilis: A Comparative Analysis Between Demographic Regions of Brazil (2014–2024)

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Introduction: *Congenital syphilis* continues to be a serious public health problem in Brazil, with significant impacts on neonatal morbidity and mortality. One of the main factors associated with the high rate of this condition is the lack of adequate treatment for pregnant women's partners, which facilitates the vertical transmission of the infection.

Methods: Secondary data were collected from the Department of Informatics of the Unified Health System (DATASUS) regarding *Congenital syphilis* cases in Brazil from 2014 to 2024. The analysis focused on comparing rates of *Congenital syphilis* across demographic regions, considering the influence of untreated partners on these rates.

Results: Between 2014 and 2024, 250.310 cases of *Congenital syphilis* were reported in Brazil. Of these, 135.693 cases (54.2%) were from untreated partners, 46.096 (18.4%) were from treated partners, and 68.521 (27.3%) were classified as ignored/blank. The southeast region has the highest rate with 108.874 (43.5%) cases and untreated partners represent 57.762 (53%) cases in this region. This is followed by the northeast region with 72.113 (28.8%) total cases and 39,608 (54.9%) cases of untreated parents. The highest rate of untreated parents occurs in the northern region with 12,599 (58.9%) cases.

Conclusions: The data indicate that *Congenital syphilis* remains a critical public health issue in Brazil, with a significant proportion of cases linked to untreated partners. The southeast and northeast regions exhibit the highest absolute numbers, while the northern region shows the highest percentage of cases from untreated partners. These findings highlight the urgent need for targeted interventions, including comprehensive prenatal screening and effective partner treatment strategies. Strengthening public health policies and awareness campaigns is essential to reducing vertical transmission rates and mitigating neonatal morbidity and mortality associated with *Congenital syphilis*.

4.2. Design and Pilot Scale Production of an Alternative Non-Live Attenuated BTV Vaccine in Yeast

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Bluetongue (BT) is an infectious disease of domestic and wild ruminants caused by Bluetongue virus (BTV), an arbovirus of the *Orbivirus* genus within *Sedoreoviridae* family. It is primarily transmitted by biting midges of the *Culicoides* genus. BTV poses a significant threat to the livestock industry, particularly sheep. To date, a total of 36 serotypes of BTV