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1.	Samal M, Siddiqui A, Srivastava V , Dar MI, Khan M, Insaf A, Ansari SH, Ahmad S	Identification of acetylcholinesterase inhibitory metabolites from hydroalcoholic extract of <i>Trifolium muqawwi</i> Dimagh using thin-layer chromatography–bioautography–mass spectroscopy and its validation using in silico molecular approach	JPC–Journal of Planar Chromatography–Modern TLC	Research	1-12	2024
2.	Srivastava V , Navabharath M, Khan M, Samal M, Parveen R, Singh SV, Ahmad S	A comprehensive review on Phyto-MAP: A novel approach of drug discovery against <i>Mycobacterium avium</i> subspecies <i>paratuberculosis</i> using AYUSH Heritage	Journal of Ethnopharmacology	Review	118482	2024
3.	Insaf A, Parveen R, Srivastava V , Samal M, Khan M, Ahmad S.	TLC-MS-Bioautographic identification of antityrosinase compounds	Journal of AOAC International	Research	1598-1607	2023

		and preparation of a topical gel formulation from bioactive fraction of RSM-optimized alcoholic extract of <i>Rubia cordifolia</i> L. stem				
4.	Jamal G, Parveen R, Khan MA, Srivastava V , Mustafa S, Ahmad S, Husain SA	A Review on <i>Valeriana wallichii</i> : Chemical composition and pharmacological research.	Current Traditional Medicine	Review	55-71	2023
5.	Srivastava V , Parveen B, Parveen R	AI in Drug Formulation and Development: Applications and Future Prospects	Current Drug Metabolism	Review	622-634	2023
6.	Khan M, Altamish M, Samal M, Srivastav V , Insaf A, Parveen R, Akhtar J, Krishnan A, Ahmad S.	Antiviral Potential of Traditional Unani Medicine in Viral Diseases with Special Emphasis on Dengue: A Review	Current Drug Targets	Review	1317-1334	2023
7.	Srivastava V , Navabharath M, Gupta S, Singh SV, Ahmad S.	Exploration of <i>Solanum xanthocarpum</i> Schrad. & Wendl. against mycobacteri	Pharmaceuticals	Research	1367	2022

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8.	Navabharath M, Srivastava V , Gupta S, Singh SV, Ahmad S.	Ursolic Acid and Solasodine as Potent Anti-Mycobacterial Agents for Combating <i>Paratuberculosis</i> : An Anti-Inflammatory and <i>In Silico</i> Analysis	Molecules	Research	274	2022
9.	Khan MA, Srivastava V , Kabir M, Samal M, Insaf A, Ibrahim M, Zahiruddin S, Ahmad S.	Development of Synergy-Based Combination for Learning and Memory Using in vitro, in vivo and TLC-MS-Bioautographic Studies	Frontiers in Pharmacology	Research	678611	2021



Article

Exploration of *Solanum xanthocarpum* Schrad. & Wendl. against *Mycobacterium avium* Subspecies *paratuberculosis* and Assessment of Its Immunomodulatory and Anti-Inflammatory Potential

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Abstract: *Mycobacterium avium* subspecies *paratuberculosis* (MAP), being a dairy-borne pathogen, resistant of pasteurization and other sterilization techniques, is a major cause for development of inflammatory bowel disorders such as Johne's disease (JD) in dairy animals and Crohn's Disease (CD) in humans, for which no therapy is available to date. In the absence of effective therapy or a vaccine, management of CD has been accomplished by removal of the affected intestines. However, usually, even after removal of 2/3 of the intestine, CD reoccurs. Hence, there exists a need to develop an alternative therapy for such infection. The potential of herbals remains unexplored against MAP and related infections. Therefore, the conducted study is a novel initiative for the evaluation of anti-mycobacterial activity of bioactive extracts of *Solanum xanthocarpum* Schrad. & Wendl. against MAP infection. The said plant was authenticated according to the Ayurvedic Pharmacopoeia of India. Qualitative and quantitative evaluation of the extracts were done using chromatographic and spectroscopic techniques. Preliminary in vitro pharmacological assessments revealed the immunomodulatory and anti-inflammatory potential of the extracts. REMA assay was conducted to determine their anti-MAP activity along with determination of the best active extract. The hydro-alcoholic extract showed the best inhibition of MAP, providing a potential ray of hope against this emerging major pathogen of animals, and associated with Crohn's disease and other autoimmune disorders in human beings.


Keywords: *Solanum xanthocarpum* Schrad. & Wendl.; Johne's disease (JD); Crohn's disease (CD); *Mycobacterium avium* subspecies *paratuberculosis* (MAP); immunomodulatory; anti-inflammatory

1. Introduction

In India, *Mycobacterium avium* subspecies *paratuberculosis* (MAP) infection is endemic in domestic livestock [1]. The infection has been reported in ruminants, wild life [2,3] and human beings. Live bacilli have been recovered from milk in domestic livestock [4,5], human breast milk [6], and other milk products [5,7]. These bacilli are excreted through milk and are not inactivated during pasteurization [8], resulting in human infection. Infection has also been associated with a large number of autoimmune disorders in the human population [9]. Infection of domestic livestock with MAP also leads to huge losses in productivity [1]. Infected animals are characterized by a decline in body condition, weight loss (which might or might not be accompanied with diarrhea), loss in productivity (milk and meat) and reduced fertility. They also become susceptible to other infections due to the growth of bacilli within macrophages in the germinal centres of lymph nodes.

Article

Ursolic Acid and Solasodine as Potent Anti-Mycobacterial Agents for Combating *Paratuberculosis*: An Anti-Inflammatory and In Silico Analysis

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Abstract: *Mycobacterium avium* subspecies *paratuberculosis* (MAP) infection in domestic livestock causes persistent diarrhea, weight loss, and death and is also a potential cause of Crohn's disease (CD) in humans; notably, treatments against MAP are insufficient, costly, and can cause adverse reactions. Hence, plant-derived bioactive constituents have been taken into consideration in this regard. Herein, we present the results of two bioactive constituents (Solasodine and Ursolic acid) that were evaluated for their safety and efficacy against MAP protein (Dephospho-Coenzyme A kinase (DPCK)) by utilizing in vitro assays and different tools of in silico biology. The ADME/*t*-test, the drug-likeness property test, pharmacophore modelling, and PASS prediction have proven that both the constituents have better binding capacities than the available antibiotic drugs used to target protein inhibition pathways. Through our observations, it can be inferred that these two phytochemicals can be adequately used to treat *paratuberculosis*, thereby combating inflammatory bowel disorders (IBD) of an autoimmune nature.

Keywords: Crohn's disease; Dephospho-Coenzyme A kinase (DPCK) protein; in silico; *Mycobacterium avium* subspecies *paratuberculosis* (MAP); REMA assay; solasodine; ursolic acid

1. Introduction

Mycobacterium avium subspecies *paratuberculosis* is the causative agent of Johne's disease (JD), a chronic infectious disease of ruminants that is widespread throughout the world and causes significant production losses and human infection (Zoonotic) (MAP). In ruminants, the disease causes debilitation or cachexia. Due to its zoonotic potential, it has received significant attention. IBD, Crohn's disease, ulcerative colitis, Type 1 diabetes, thyroiditis, and rheumatoid arthritis are examples of autoimmune diseases and co-morbidities that increase susceptibility to MAP infection [1–11]. When MAP infects susceptible people, it often kills MAP bacilli in the gut, thereby causing inflammatory reactions and possibly harmful inflammatory reactions in other organs. In some cases, chronic diseases have been suspected to be associated with the etiology of *Mycobacterium avium* subspecies *paratuberculosis* (MAP) in domestic livestock. This pathogen is endemic across the globe. It is estimated that around 72.0% of US dairy cattle flocks are infected with Johne's disease. In the last 28 years, there has been an increasing trend in the bio-load of domestic livestock [12], which is found to be highest (16.0–54.7%) in sheep, followed by buffaloes (28.3–48.0%), cows (6.0–39.3%), and goats (9.4–20%) [13]. Global and Indian researchers have revealed extremely high levels of live MAP bio-loads in raw and liquid milk as well as milk products. Using six tests (Microscopy, IS900 PCR, I_FAT, d_ELISA,