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Strain-Specific Therapeutic Potential of *Lactiplantibacillus plantarum*: A Systematic Scoping Review Protocol

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ADMINISTRATIVE INFORMATION

Support - Chulalongkorn University.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 February 2025 and was last updated on 19 February 2025.

INTRODUCTION

Review question / Objective This systematically scoping review aims to evaluate the therapeutic potential and clinical benefits of specific *Lactiplantibacillus plantarum* (*L. plantarum*) strains in human health, identifying their strain-specific effects across various medical conditions.

Background *L. plantarum* stands out due to its broad-spectrum health benefits. As a lactic acid bacterium within the *Lactobacillus* genus, *L. plantarum* is commonly found in the food industry particularly in various fermented foods, as well as in the human gastrointestinal tract. Its remarkable ability to survive harsh environments, tolerate in various situations make it a strong candidate for therapeutic applications.

Rationale Despite the growing interest in *L. plantarum*, a significant gap remains in understanding the diversity among its strains and their specific health benefits. While many studies focus on its safety and general health benefits, there has been limited attention to the strain-specific effects on individual health conditions.

METHODS

Strategy of data synthesis We searched through PubMed and Embase using the search strategy, which utilizes the keyword "*Lactiplantibacillus plantarum**" in combination with "human" and "animals", along with their respective synonyms.

Eligibility criteria Eligible studies included those that assessed *L. plantarum* as a monotherapy, without combining it with other probiotics species, in human studies. The following types of studies

were excluded: (1) Non-original research (e.g. reviews, protocols, letters, comments, and guidelines); (2) Studies that did not focus on *L. plantarum* monotherapy (i.e., mixing with other probiotic species); (3) Non human or non-animal studies; (4) Unpublished or non-peer-reviewed studies; and (4) Studies published in languages other than English.

Source of evidence screening and selection An information specialist assisted in designing the search strategy to identify original, peer-reviewed articles that evaluated the therapeutic potential of specific *L. plantarum* strains. The study selection process involved four independent reviewers, who screened articles for eligibility based on predefined inclusion and exclusion criteria. Any discrepancies between reviewers were resolved through consensus discussions.

Data management Four independent reviewers extracted data from the selected studies. The extracted information included: (1) Study characteristics (2) Patient characteristics (3) Outcomes (measurement methods for each disease and any additional relevant information).

Reporting results / Analysis of the evidence The data will be qualitatively categorized based on each health condition related to *L. plantarum*.

Presentation of the results The data will be present qualitatively.

Country(ies) involved Thailand.

Keywords *L. plantarum*, Gut microbiome, Health conditions.

Contributions of each author

Author 1 - Oranut Chatsirisakul - Screening the paper, extracting data, writing-original draft preparation and writing-review and editing.

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Author 2 - Natasha Leenabanchong - Extracting data, and writing-original draft preparation.

Author 3 - Yada Siripaopradit - Screening the paper.

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