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Antibacterial activities of medicinal plants used in Mexican traditional medicine

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Aim: The aim of this review is to provide an extensive summary of the in vitro antibacterial activities of medicinal plants popularly used in Mexico to treat infections, and to provide the ethnomedical information that has been published for these species.

Materials & Methods: Bibliographic investigation was carried out by analyzing local and international peer-reviewed papers selected by consulting worldwide accepted scientific databases from 1995 to 2014. Specific information on the evaluated plant parts, type of extracts, tested bacterial strains, and inhibitory concentrations for each one of the species is provided. The ethnomedical information for the active species was recorded, as well as their popular names and local distribution. Information about the compounds that have been isolated and purified, is included. This review also incorporates an extensive search of the available toxicological reports on the recorded species, as well as worldwide registries of plant patents used in the treatment of bacterial infections.

Results: In vitro demonstrated antibacterial activities of 345 plant species pertaining to 95 botanical families have been recorded. Extracts were studied against 74 bacteria species focusing especially on Staphylococcus aureus, Mycobacterium tuberculosis, Escherichia coli and Pseudomonas aeruginosa. The plant families Asteraceae, Fabaceae, Lamiaceae and Euphorbiaceae were the ones with the highest number of active species. Information related to popular uses indicates that most of the plants are employed to treat other conditions in addition to infections. Distribution of Mexican plants extended from those that were reported to grow in just one state to those that include all 32 states of the country. From 78 plant species, 225 compounds have been isolated. From the total plant species, only 140 (40.57%) had at least one report on toxic effects. From 1994 to July 2014 a total of 11,836 world-wide antibacterial patents prepared from different sources were recorded, while only 36 antibacterial patents from plants were registered.

Conclusion: Studies on the antibacterial in vitro activity of medicinal plants popularly used in Mexico to treat infections indicate that both the selection of plant material and the investigation methodologies vary. Standardized experimental procedures as well as in vivo pharmacokinetic studies to document the effectiveness of plant extracts and compounds are necessary. For the vast majority of the plant extracts the mechanisms of action by which plant materials exert antibacterial activity remains to be determined

Biography

Ashutosh Sharma has completed his PhD from State University of Morelos, Mexico and Post-doctoral studies from National Autonomus University of Mexico (UNAM). Currently, he is the Biotechnology Program Director and Full Time Research Professor at Instituto Tecnológico y de Estudios Superiores de Monterrey, Queretaro, Mexico, a world class university. He has published more than 16 papers in international reputed journals and is reviewer of several international journals as well. He is inventor of 1 patent, co-author of 1 book and co-author of 2 book chapter. He is the youngest high level Professor of the university. He has presented more than 30 scientific work in various countries like USA, Holland, Chile, Brazil, India, Canada, China and Mexico. He is member of various scientific organizations and comitees. He has recieved various awards, national and international scholarships during his career. He has fellowship of the prestigious national research system of Mexico, where he also serve as acredited evaluator for revising scientific project funded by National science and technology foundation of Mexico. Currently he directs thesis for 2 Master students and 1 PhD student.

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