

Piperaceae Genus: A comprehensive overview on extraction, isolation, phytochemistry and pharmacology

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ABSTRACT

Owing to the extensive significant effects of the medicinal plants due to their rich sources of macro as well as micronutrients, bionutrients and bioactive phytoconstituents; are motivating researchers to explore the great hidden potentials in phyto-based chemical constituents for the development of new drugs. Scientists during their past three decades have proved that these natural products have prevented not only chronic such as cancer, diabetes and coronary heart disease but also treated severe viral and other infections. The secondary metabolites have pharmaceutical effect or have disease-preventing functions due to the presence of detoxifying agents, dietary fibres, antioxidant potential, immunity-potentiating as well as neuropharmacological agents and anticancer etc. The various classes of these functional agents contain a wide range of chemicals with different potencies. Some of these phytochemicals can display more than one function. There is, however, much scope for further systematic research in screening these indigenous floras for these phytochemicals and assessing their potential to protect different types of diseases.

Economically Piperaceae is an important genus for the production of pepper in the world wide spice markets. The king of spices is *Piper nigrum* Linn. (black pepper), is no doubt the most famous and popular spice. This genus has various activities like antifeeding, antibacterial, antifungal, antiinflammatory, antiamebic, antiplatelets, insecticidal, antioxidant, cytotoxic, antiplasmodial, DNA damaging activities etc. These plants are being utilized by many traditional medicinal systems namely Chinese medicine, Indian Ayurvedic system and folklore medicine of Latin America. Some parts of this genus plants are used for the treatment of respiratory tract viz. cough, bronchitis, asthma as well as it has antiapoptotic, antibacterial, anti-colon toxin, antidepressant, antifungal, antidiarrhoeal, anti-inflammatory, antimutagenic, anti-metastatic activity, antioxidative, antiriyretic, antispasmodic, antispermatogenic, antitumor, antithyroid, ciprofloxacin potentiator, cold extremities, gastric ailments, hepatoprotective, insecticidal activity, intermittent fever and larvicidal activity. Secondary metabolites of this genus are also used as drug, preservative, insecticidal and larvicidal control agents. This plant contains many chemical constituents such as amides, piperidine, piperine, chavicin, starch, protein, steroids, propenylphenols, pyrones, chalcones, flavones and flavanones, lignin, sesquiterpenes, piperlotine, benzoic acid derivatives, lignans, neolignans and miscellaneous compounds even volatile oils such as terpenes, phellandrene, caryophyllene etc. are found to be very rich in these plants. One of the major metabolite piperine influenced and activated the biomembrane to absorb variety of active agents, increased serum concentration, reducing mutational events, tumour inhibitory activity. Almost all of the extraction methods are used to isolate and purify metabolites from this genus along with advanced spectroscopic methods for their characterization and identification.

Keywords: Bionutrients, Characterization Techniques, Extraction Methods, Phytopharmaceutical, Piperaceae, Natural Products.
