ABSTRACT

India, the world's top fruit producer, is exploring the potential of mixed fruit peels for various uses. Organic waste from fruits and vegetables contributes to municipal solid trash and environmental issues. Fruit waste contains beneficial phytochemicals like carotenoids, polyphenols, and vitamins, which can be used in various industries such as food formulations, antioxidant-rich cosmetics, and herbal medications. Fruit residual wastes can be collected and processed into fine powder, which has high potential for food packaging and extraction of bioactive compounds. The study found 45 bioactive substances in fruit waste powder, mostly plant secondary metabolites, with antioxidant, antibacterial, and antifungal qualities making them ideal for treating various illnesses. Fruit peels have high concentrations of anti-inflammatory, antibacterial, and antioxidant compounds, making them ideal for packaging. Traditional extraction methods include maceration, soxhlet extraction, solvent extraction, and percolation, while new methods include supercritical fluid extraction, microwave-assisted extraction, enzyme-assisted extraction, pulsed electric field extraction, ultrasound-assisted extraction, and pressurized liquid extraction.