





Chapter A Review on Screening, Isolation, and Characterization of Phytochemicals in Plant Mate...

A Review on Screening, Isolation, and Characterization of Phytochemicals in Plant Materials: Methods and Techniques

February 2023

DOI: [10.4018/978-1-6684-6737-4.ch001](https://doi.org/10.4018/978-1-6684-6737-4.ch001) Arvindganth Rajasekar ·  Priyadharsini Deivasigamani ·  Godavari Amar · [Show all 5 authors](#) ·  Sasikala SekarCitations

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Abstract

Plants are documented in the pharmacological manufacturing on their extensive essential diversity by fine such as their broad range of pharmacological activities. The biologically dynamic compounds existing in plants are named phytochemicals or plant secondary metabolites. The screening, isolation, and characterization of phytochemicals involve a multidisciplinary approach, involving knowledge from various scientific fields. Screening involves identifying plant species or parts rich in specific bioactive compounds, using methods like ethnobotanical surveys, traditional knowledge, and literature review. Isolation techniques, such as maceration, Soxhlet extraction, supercritical fluid extraction, and microwave-assisted extraction, are used to separate phytochemicals from complex plant matrices. Chromatographic techniques are used to determine the chemical composition and structural characteristics of isolated compounds. This review deals with the collection of plants, the extraction of dynamic mixtures as of the plant-based materials and its phytochemical screening by qualitative and quantitative analysis methods.

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Percent Yield (%)	60.5	55.7	59.1	74.2
Color	Brown	Dark Brown	Dark Green	Brownish-green
Odor	Strong Odor	Strong Odor	Unpleasant	Strong Unpleasant
Density (g/cc)	0.83	0.87	0.77	0.77
pH	8.52	8.24	7.12	7.39
Boiling Point (°C)	102.7	100.7	98.7	92.7
Solubility in:				
Water	Soluble	Soluble	Soluble	Soluble
Chloroform	Insoluble	Insoluble	Insoluble	Slightly Soluble
Alcohol	Soluble	Soluble	Soluble	Soluble
5% HCl	Soluble	Soluble	Soluble	Soluble
5% NaOH	Soluble	Soluble	Soluble	Soluble
Phytochemical Analysis				
Alkaloid	P	N	N	N
Anthraquinone	P	P	P	P
Flavonoid	P	N	N	N
Glycoside	N	P	N	N
Saponin	P	P	P	P
Steroid	P	P	P	P
Tannin	N	N	N	N
Terpenoid	P	P	P	P

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Acetone	Methanol	Hexane	Acetone	Methanol	Hexane	Acetone	Methanol	Hexane	one	Methan
+	+	+	+	+	+	+	+			+
+	+	+	+	+	+	+	+			+
+	+	-	+	+	+	+	+			+
+	+	+	+	+	-	+	+			+
-	+	+	+	+	-		+			+
+	+	-	-	+	+	+	+			+
+	+	+	-	+	+	+	+			+
+	+	+	+	-	+	+	+			+
(+)Present, (-) Absent			(+) present, (-) Absent			+	+			-

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IC ₅₀ (ppm)	LC ₅₀ ppm
446,88	785,03
259,48	73,3
495,67	300
1,72	

...e compounds which are used to curing of various diseases. In
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