



RESEARCH ARTICLE

BIOCHEMISTRY

**PHYTOCHEMICAL ANALYSIS OF *CASSIA OBTUSIFOLIA*, *CASSIA AURICULATA*, *TEPHROSIA PURPUREA*, *HELICTRES ISORA* AND *CENTELLA ASIATICA*****HARSHAL A DESHPANDE AND SANJIVANI R BHALSING\***

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**ABSTRACT**

It is an effort of making the analysis of the five species which are *Cassia obtusifolia*, *Cassia auriculata*, *Tephrosia purpurea*, *Centella asiatica* and *Helictres isora*. Ethanolic extract of leaves, stem, seeds and roots of *Cassia obtusifolia* and *Cassia auriculata* revealed the presence of alkaloids, flavonoids, tannins and anthroquinones while, it is found that the saponins were absent. Phytochemical analysis in the ethanolic leaf extract of *Centella asiatica* and *Tephrosia purpurea* showed the presence of flavonoids, tannins, saponins, while alkaloids were absent. The phytochemical constituents like tannins, flavonoids, anthroquinones and saponins were not detected, while, only alkaloids were detected in the ethanolic extract of fruit material of *Helictres isora*. The study establishes some concordance between the local medicinal applications of the plants investigated and their constituent phytochemical groups which are relevant to the pharmaceutical industry. The experiment carried out by using different plant parts of the plants revealed the presence of different types of phytochemical constituents.



## KEYWORDS

Phytochemical, *Cassia obtusifolia*, *Cassia auriculata*, *Tephrosia purpurea*, *Centella asiatica* and *Helictres isora*.

## INTRODUCTION

Medicinal plants are natural sources of compounds that can be used against many diseases today<sup>1</sup>. The medicinal values of these plants lie in bioactive phytochemical constituents that produce definite physiological actions on the human body. These bioactive phytochemical constituents in medicinal plant include alkaloids, flavonoids, phenolic compounds, tannins, anthracene derivatives and essential oils<sup>2</sup>. The world is now looking towards India due to its rich biodiversity of medicinal plants and abundance of traditional medicine systems<sup>3</sup>. There is a need that the medicinal plants be evaluated for phytochemistry so as to determine the potentials of these indigenous sources of medicines. Therefore in present study five medicinal plants were selected for phytochemical analysis.

*Cassia obtusifolia*, *Cassia auriculata* and *Tephrosia purpurea* belonging to the Leguminosae family are increasingly being used not only as herbal remedies in complementary and alternative medicines but also in conventional therapy in many parts of the world. From many years especially in India where they are widely distributed, they have been shown to possess antibacterial, antifungal properties<sup>4,5</sup>

*Centella asiatica* of Apiaceae family is widely used for its medicinal properties like sedative, analgesic, antidepressive, antimicrobial, antiviral and immunomodulatory<sup>6</sup>

Almost all parts of *Helictres isora* of Sterculiaceae are used in the traditional medicinal systems and is reported to be

effective against HIV, diabetes, polio and asthma. The fruits are astringent, acrid, refrigerant, demulcent, constipating, stomachic, vermifuge vulnary, haemostatic and urinary astringent and has anti antispasmodic activity<sup>7</sup>.

## MATERIALS AND METHODS

### COLLECTION AND IDENTIFICATION OF THE PLANT MATERIAL

The medicinal plants namely: *Cassia obtusifolia*, *Cassia auriculata*, *Tephrosia purpurea*, *Centella asiatica* and *Helictres isora* were collected and authenticated from Mahatma Phule Krishi Vidhyapeeth, Rahuri, (District – Ahmednagar), Maharashtra. .

### SAMPLING OF THE PLANT MATERIAL

Fresh leaves, stem, root, seeds and fruits of the above medicinal plants which are free from disease were collected. The plant material was washed thoroughly 2 – 3 times with running tap water. All the plant materials were then air dried under shade. The total dried mass was grounded to a fine uniform powder. The powder obtained after grinding was kept in small plastic bags with proper labeling.

### EXTRACTION OF PLANT MATERIAL

Exhaustive Soxhlet extraction of 20 gms of the powder sample was carried out at room temperature for 48 hours in 2.5 L of ethanol. The mixture was filtered using Whatman no -1 filter paper and the filtrate solution was concentrated and evaporated on a rotary evaporator (Buchi, R – 124, Switzerland) to obtain a residue which was used for further investigations.

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Alkaloids, anthroquinones were assayed by the standard methods of Brain and Turner<sup>8</sup> while tannins as well as saponins and flavonoids were assayed as per the protocol of Meghvansi<sup>9</sup> and Willstatter<sup>10</sup> respectively.

**RESULT AND DISCUSSION**

Phytochemical analysis of ethanolic extracts of leaf, stem, seed and root sample of *Cassia obtusifolia* and *Cassia auriculata* showed the presence of alkaloids, tannins, flavonoids and anthroquinones while, saponins was not detected. Phytochemical analysis was previously reported by Kalaichelvi *et al.*<sup>11</sup> from root and leaf sample of *Cassia auriculata* which exhibited the presence of anthroquinones, alkaloids, flavonoids, steroids, tannins and phenolic compounds. *Cassia* species are rich sources of polyphenols, anthroquinone derivatives, flavonoids and polysaccharides and tannins<sup>12</sup>. The phytochemical analysis of the ethanolic extract in the leaf sample of *Tephrosia purpurea* showed the presence of phytochemical constituents such as tannins, flavonoids and saponins, but alkaloids and anthroquinone glycosides were absent (Table – 1). Meghvansi *et al.* (2009) reported similar results which showed the presence of tannins, saponins, flavonoids, phenols, while alkaloids, steroids, cardiac glycosides, terpenoids were reported to be absent. Similar to our observation, Vrushabendru Swamy *et al.*<sup>13</sup> also reported the presence of phenols, tannins, flavonoids, and terpenoids in the ethanolic extract of leaf sample in *Tephrosia purpurea*. The phytochemical analysis of the ethanolic extract in the fruits of *Helictres iosra* showed the presence of alkaloids, while the phytochemical constituents like tannins, flavonoids, anthroquinones and saponins were

absent. Staden *et al.*,<sup>14</sup> investigated phytochemical constituents in all the plant material of Sterculiaceae species and reported the absence of alkaloids, cyanogenic glycosides and saponins in *Dombeya burgesiae* and *Dombeya cymosa*. Sonibare *et al.*,<sup>15</sup> investigated the phytochemical screening in the ethanolic extract of the leaf sample of the four species of *Cola* (Sterculiaceae) and showed the presence of alkaloids, saponins and tannins. The ethanolic extract of the leaf sample of *Centella asiatica* showed the presence of phytochemical constituents such as flavonoids, tannins, saponins, while alkaloids and anthroquinones were found to be absent. Sarayu *et al.*,<sup>16</sup> also reported the similar results in the methanolic extract of leaf sample in *Coriander sativum* the presence of carbohydrates, flavonoids, steroids, saponins and tannins. Efforts are being made to further isolate and characterize the compounds and also to test for their bioactivities.

India is a home to a variety of traditional medicine system that relies to a very large extent on native plant species for their raw drug material<sup>17</sup>. Therefore, now there is a need to look back towards the traditional medicines which can serve as novel therapeutic agents.

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**Table – I**  
**Phytochemical analysis of of *Cassia obtusifolia*, *Cassia auriculata* , *Tephrosia purpurea* , *Helictres isora* and *Centella asiatica***

Phytochemicals	<i>Cassia obtusifolia</i>				<i>Cassia auriculata</i>				<i>Tephrosia purpurea</i>	<i>Helictres isora</i>	<i>Centella asiatica</i>
	Leaves	Stem	Seeds	Root	Leaves	Stem	Seeds	Roots	Leaves	Fruits	Leaves
Alkaloids	+	+	+	+	+	+	+	+	-	+	-
Tannins	+	+	+	+	+	+	+	+	+	-	+
Flavonoids	+	+	+	+	+	+	+	+	+	-	+
Saponins	-	-	-	-	-	-	-	-	+	-	+
Anthroquinones	+	+	+	+	+	+	+	+	-	-	-

(+): Indicates the presence of phytochemicals

(-): Indicates the absence of phytochemicals

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