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Qualitative screening of bioactive compounds from two weed species of *Cassia*

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ABSTRACT

Cassia tora and *Cassia uniflora* belong to the Caesalpiniaceae family and is known as "weed" throughout India. The concept of using plants as medicines is very ancient in this part of the world. Behind this concept, the capability of the plant to cure diseases due to its chemical property which is present in different parts of a plant plays a major role to control diseases. The present study deals with the qualitative phytochemical screening of two different *Cassia* species seeds viz., *Cassia tora* and *Cassia uniflora*. For qualitative bioactive chemical compound analysis, a total of 20 different tests were carried out for seeds of both the *Cassia* species. The current study shows that they possess typical characteristics of curing various diseases. The present study highlights the screening of qualitative biologically active compounds such as carbohydrates, protein, alkaloids, flavonoids, tannin, anthraquinone, quinine, resin, and glycosides. This study also shows the difference between the two *Cassia* species as well as its medicinal value through bioactive compound analysis.

Key word : *Cassia tora, Cassia uniflora, Weeds, Bioactive compound, Medicinal value.*

Introduction

The species which grow on their own, without human efforts are termed as "weeds" (Hemen Sarma *et al*., 2008) and many of the weeds are found to be medicinally important (Gambhire and Biradar, 2016). WHO Traditional Medicinal Strategy 2014-2023 estimated that the use of traditional medicines in developing nations will be increased by 20% till 2020 (Ansari Asba and Bhot Meeta, 2017). Plants have secondary metabolite or phytochemical compounds But weeds also show phytochemical bioactive constituents. The current study is focused on qualitative phytochemical screening of two different *Cassia* species seeds viz., *Cassia tora* and *Cassia uniflora*. Both these species are growing abundantly all over India. There is different research works conducted to find out the application of both the species (Ansari Asba and Bhot Meeta, 2017; Meena and Yadav, 2008). *Cassia tora* is a wild crop and grows in most of India (Arulpandi and Kamimozhi, 2011). According to Ayurveda, the leaves and seeds are acrid, laxative, anthelmintic, ophthalmic, liver tonic, cardiotonic, and expectorant (Swati Supare and Mansi Patil, 2015). *C. tora* seeds are hard, 1 cm long, 3-4 mm thick, oblong towards both ends, greenish-brown to brownish-black, smooth, and shiny (Suradkar *et al*., 2017). Seeds of these *Cassia* species show various phytochemical bioactive chemical compounds such as carbohydrates, protein, amino acids, alkaloids, flavonoids, tannin, anthraquinone, quinine, resin, and glycosides. Hence, these researched study work revealed that the *Cassia tora* and *Cassia uniflora* showed medicinal importance and uses through this phytochemical screening. The data of these species growing in this region of 'Gir', one of the dense forest of Gujarat state, is yet not been analyzed.

Cassia tora seed

Cassia uniflora seed

Materials and Methodology

Collection of plant material

Cassia tora seeds collected from Gundala (Gir), Gujarat. *Cassia uniflora* seeds collected from the roadside near Bhakta Kavi Narsinh Mehta University, Khadiya, Gujarat.

Preparation of sample

Collected seeds of *Cassia tora* and *Cassia uniflora* plant were dry shaded and milled using a magnetic blender to form a powder and stored in an airtight polythene bag for further use of analysis.

Extraction method

In a conical flask, 10 g of *Cassia tora* and *Cassia uniflora* seed powder was infused with 100 ml of different solvents: n- butanol, and chloroform at room temperature, and the conical flask was tightly plugged with cotton. After 24 hours, the mixture was filtered using the Whatman filter paper no. 1. Solvents were evaporated at room temperature and stored in a sterile bottle at 4 ^{0}C for detecting the biochemical compound from plant samples (Sumangala Rao and Suresh, 2012; Dubey *et al*., 2015). There are various bioactive phytochemical constitutes such as carbohydrates, alkaloids, flavonoids (Gusthinnadura Oshadie De Silva *et al*., 2017) proteins, tannins, phenolic compounds (Saxena and Saxenai, 2012) Terpenoids, cardiac glycosides, anthraquinone (Ajiboye *et al*., 2013) carboxylic acids, resins, quinines (Anoma Geethani Samarawickrama *et al*., 2017).

Results and Discussion

Cassia tora seed

n – butanol extract

In seeds of *Cassia tora*, major bioactive qualitative phytochemical constituents in the n-butanol extract, it was noticed that carbohydrates, protein, flavonoids, terpenoids, cardiac glycosides, anthraquinone, carboxylic acid, quinine, and the phenolic compound is present and alkaloids, tannin, and resin is absent.

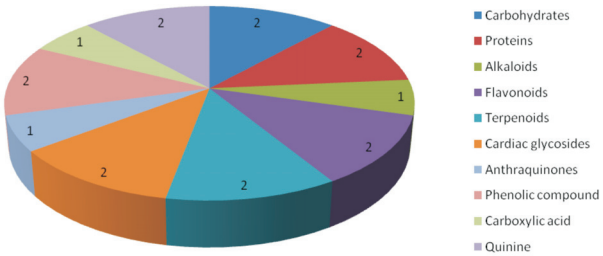

Chart 1. *Cassia tora phytochemicals*

**('1'in the graph denotes biological compound present in only one solvent, whereas '2' denotes bioactive compound present in both solvents*)

Chloroform extract

In seeds of *Cassia tora*, major bioactive qualitative phytochemical compounds in chloroform extract, it was observed that carbohydrates, protein, flavonoids, terpenoids, cardiac glycosides, alkaloids, quinine, and the phenolic compound is present and anthraquinone, carboxylic acid, tannin, and resin is absent in chloroform extract of *Cassia tor*a seeds.

Cassia uniflora seed

n-butanol extract

In seeds of *Cassia uniflora*, major bioactive qualitative compounds in n-butanol extract, it was found that

Table 1. Number of bioactive compounds in *Cassia tora* seed

Constituent	n - butanol	Chloroform
Carbohydrates		
Mollisch's test	+	+
Fehling's test	+	+
Benedict's test	+	-
Proteins		
Biuret test	+	+
Xanthoproteic test	+	-
Alkaloids		
Mayer's test	-	+
Wagner's test	-	+
Hager's test	-	-
Flavonoids		
Alkaline reagent test	+	+
Lead acetate test	+	-
Terpenoids		
Salkowaski's test	+	+
Cardiac glycosides		
Keller-Killani test	+	+
Anthraquinones		
Benzene test	+	-
Tannins		
Ferric chloride test	–	–
Lead acetate test	–	–
Phenolic compound		
Ferric chloride test	+	+
Lead acetate test	+	+
Carboxylic acid		
Sodium bicarbonate test	+	-
Resin		
Acetone test	-	-
Quinine		
Sodium hydroxide test	+	+

*(+: present, -: absent)

Table 2. Number of bioactive compounds in *Cassia uniflora* seed

Constituent	n - butanol	Chloroform
Carbohydrates		
Mollisch's test	+	+
Fehling's test	+	+
Benedict's test	+	+
Proteins		
Biuret test	+	+
Xanthoproteic test	-	+
Alkaloids		
Mayer's test	-	
Wagner's test	+	+
Hager's test	+	+-
Flavonoids		
Alkaline reagent test	–	–
Lead acetate test	–	–
Terpenoids		
Salkowaski's test	+	+
Cardiac glycosides		
Keller-Killani test	+	-
Anthraquinones		
Benzene test	+	+
Tannins		
Ferric chloride test	–	–
Lead acetate test	–	–
Phenolic compound		
Ferric chloride test	–	–
Lead acetate test	-	–
Carboxylic acid		
Sodium bicarbonate test	-	+
Resin		
Acetone test	+	-
Quinine		
Sodium hydroxide test	+	+

*(+: present, -: absent)

carbohydrates, protein, alkaloid, terpenoids, cardiac glycosides, anthraquinone, quinine, and resin is present and flavonoids, tannin, carboxylic acid, and the phenolic compound is absent.

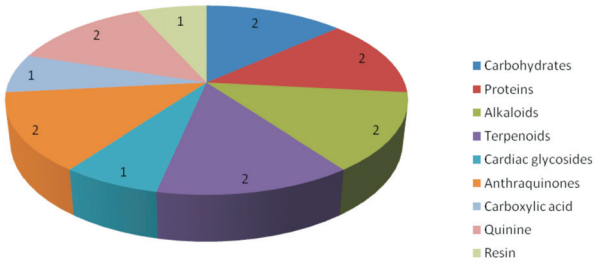

Chart 2. *Cassia uniflora* phytochemicals
('1'*in the graph denotes biological compound present in only one solvent, whereas '2' denotes bioactive compound present in both solvents*).

Chloroform extract

In seeds of *Cassia uniflora*, the major bioactive qualitative compound in chloroform extract, it was noticed that carbohydrates, protein, alkaloids, terpenoids, quinine, anthraquinone, the carboxylic acid is present and tannin, flavonoids, resin, cardiac glycosides and phenolic compound is absent.

Conclusion

The two species taken for the study of *Cassia tora* and *Cassia uniflora* are growing extensively in the area of 'Gir' of the Saurashtra region. The aim of the study is that both the plant species *Cassia* having enormous bioactive compounds, yet people are treating

these plants as weeds. The qualitative data reflects that these plants, the so-called weeds are having the potential of being used for medicinal purposes. These constituents show various activities which can be effective on human recuperate against many diseases and after its quantitative data, it may show any useful drug for treating against severe diseases in the future. As both the species, *Cassia tora* and *Cassia uniflora* are weeds, they have the potential to grow excessively and abundantly in many diverse habitats, and hence, it may also have the potential to be used as medicine, beverages, etc. against many diseases. Therefore, in the future, these species serve as safe as well as cheap drugs. Further, the study extended for measuring quantitative bioactive compound al analysis.

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