



**PHYTOCHEMICAL AND BIOLOGICAL ACTIVITIES OF *CASSIA GLAUCA*: A  
REVIEW**

Khaled Rashed

*Department of Pharmacognosy, National Research Centre, 33 El Bohouth st.-Dokki, Giza, P.O.12622, EGYPT*

**ABSTRACT**

*Cassia glauca* is a plant from Family Leguminosae and it is has been widely used traditionally for treating diabetes, gonorrhoea, and blennorrhagia. Furthermore, it was traditionally used for its central depressant, diuretic, antimalarial, and purgative effects. Different extracts of *Cassia glauca* were previously evaluated for several pharmacological activities. Alcoholic and water extracts of the aerial parts and seeds of *Cassia glauca* were evaluated for their antioxidant activity.

**Keywords:** *Cassia glauca*, chemical compounds, plants, bioactivities.

## INTRODUCTION

In the recent years traditional or complementary medicine has seen an upsurge and according to two studies, almost 48.5% Australian respondents, and 34% of American respondents had used at least one form of unconventional therapy including herbal medicine [1, 2]. Medicinal plants have been used for thousands of years in folk medicines in developing and developed countries. According to the WHO, some nations still rely on plant-based treatments as their main source of medicine and developing nations are utilizing the benefit of naturally sourced compounds for therapeutic purpose [2]. Medicinal plants are playing an important role as a source of effective anticancer agents and it is significant that 60% of currently used anticancer agents are derived from natural source including plants [3]. Cassia genus (family Leguminosae) represents one of the largest and diverse groups of flowering plants, including herbs to trees. Plants of the genus Cassia are widely distributed in most tropical and subtropical countries. Cassia species have biological and medical activities such as hepatoprotective, antibacterial, antifungal, antioxidant, anti-tumor, antidiabetic and antiparasitic (6). Species of the genus Cassia have been also used as laxative, purgative, antipyretic, antiviral, as well as anti-inflammatory agents. Many reports have shown the Cassia species have antimicrobial, antidiabetic, antimalarial, anticarcinogenic, hepatoprotective and cytotoxic effect against liver carcinoma cell line (Hep G2) [4,5]. *Cassia glauca* has been widely used traditionally for treating diabetes, gonorrhoea, and blennorrhagia. Furthermore, it was traditionally used for its central depressant, diuretic, antimalarial, and purgative effects [6–8]. Different extracts of *Cassia glauca* Lam. were previously evaluated for several pharmacological activities. Alcoholic and water extracts of the aerial parts and seeds of *Cassia glauca* were evaluated for their antioxidant activity [9–13]. This review gave phytochemistry and bioactivities of the plant.

### Chemical Compounds:

The defatted 85 % methanolic extract from the leaves of *Cassia glauca* Lam. (Family Leguminaceae) has many compounds; as Di-(2-ethylhexyl) phthalate (DEHP), apigenin and luteolin, Quercetin, quercetin-3-O- $\beta$ -D-glucopyranoside and kaempferol-3-O-rutinoside were isolated and identified from ethyl acetate fraction whereas from the n-butanol fraction three compounds were identified as D (+)-pinitol, quercetin-3-O- $\alpha$ -L-rhamnopyranosyl-(1 $\rightarrow$ 6)- $\beta$ -D-glucopyranoside (Rutin) and quercetin-3-O-[ $\alpha$ -L-rhamnopyranosyl-(1 $\rightarrow$ 2)- $\alpha$ -L-rhamnopyranosyl-(1 $\rightarrow$ 6)]- $\beta$ -D-glucopyranoside (14).

GC/MS was used for the identification of volatiles as well as saponifiable and unsaponifiable matters. Fifty-two compounds were identified in the volatiles. The volatiles were composed mainly of oxygenated compounds. Andro-encecalinol was the major component. Twenty-three fatty acids were found in the sap fraction. The unsaturated fatty acids represented (11.62%). The most abundant ones were oleic and linoleic acids. Thirty-two compounds were identified in unsaponifiable matter, mostly hydrocarbons. The major compound was pinitol. Limonene, azulene, phytol and squalene were present in considerable amounts (15).

## **Bioactivities:**

### **Anticancer effect:**

The results indicated that *C. glauca* leaves ether extract shows significant anticancer activity against MCF-7 and HT-29, and chloroform and methanol extracts show against A549, the activity may be due to the presence of flavonoids and polyphenols (16). Kaempferol 3-O- $\beta$ -D-rutinoside isolated from *Cassia glauca* leaves extract showed high cyto-toxic activity against MCF-7 and HepG-2 cell lines (16).

### **Antioxidant properties:**

Antioxidant activity of methanolic extracts of the leaves of seven Egyptian *Cassia* species was investigated using two methods, the phosphomolybdate method and 1,1 diphenyl-2-picrylhydrazyl radical (DPPH) scavenging activity method. The results revealed that *C. glauca* is the most potent species and that the activity of other plant species decreases in the following order: *C. grandis* > *C. nodosa* > *C. fistula* > *C. didymobrya* > *C. occidentalis* > *C. sophera* (17).

### **Antidiabetic Activity:**

The antidiabetic activity of aqueous extract of *Cassia glauca* leaf was evaluated by using normal and streptozotocin-induced diabetic rats. After the oral administration of aqueous extracts at doses of 500 mg/kg body weight, blood glucose levels and body weights were monitored at specific intervals. Glibenclamide was used as a reference drug at a dose of 0.25 mg/kg mg/kg. The various parameters studied included serum lipid levels, liver glycogen content, serum insulin level, urea creatinine, total hemoglobin and glycosylated hemoglobin in diabetic and normal rats. On oral administration of aqueous extract of *Cassia glauca* leaf at a dose of 500 mg/kg, normoglycemic rats did not show any significant effect on blood glucose levels, whereas aqueous extract showed statistically significant effect ( $p < 0.001$ ) by reducing the effect of external glucose load. In chronic model of diabetic, aqueous extract of *Cassia glauca* leaf at a dose of 500 mg/kg and glibenclamide (0.25 mg/kg) were administered for 21 days. At the end of treatment, there was significant increase in the body weight, liver glycogen, serum insulin level and the HDL cholesterol levels. There was a significant decrease in fasting blood glucose, glycated hemoglobin, total cholesterol and serum triglycerides. Our results suggest that *Cassia glauca* leaf have potent antidiabetic property, justifying the use of drug for the treatment of diabetes mellitus (18).

## **CONCLUSION**

*Cassia glauca* is an important source of various phyto-constituents that have several bioactivities.

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