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Original Article

ANTIOXIDANT AND ANTI-INFLAMMATORY POTENTIAL OF QUCERTIN

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ABSTRACT

Objective: In the present study the antioxidant potential and anti-inflammatory effect of qucertin compound was assessed.

Methods: The antioxidant potential of the drug was determined by ORAC assay and DPPH assay. Likewise for anti-inflammatory studies, RBC's were collected from healthy volunteers and the hemo protective activity of the drug was carried out at various concentrations.

Results: The results showed that qucertin has a positive effect on both the parameters. The probable reasons governing the facts are discussed in the light of previous literature.

Conclusion: The results show that qucertin seems to be a good replacement for chemical therapeutic drugs as it has antioxidative and anti-inflammatory properties.

Keywords: Qucertin, Antioxidant, Anti-inflammatory, Hemoprotective.

INTRODUCTION

Flavonoids, a large group of natural polyphenolic compounds, are powerful antioxidants found in various fruits, vegetables, tea, red wine, and medicinal herbs. Flavonoids can scavenge free radicals and other oxidizing intermediates because of their phenolic hydroxyl groups and thus contribute to the counteraction of body against a great variety of diseases [1].

Quercetin is a unique bioflavonoid that has been extensively studied by researchers over the past 30 years. Bioflavonoids were first discovered by Nobel Prize laureate Albert Szent Gyorgyi in the year 1930. Flavonoids belong to a group of natural substances with variable phenolic structure and are found in the fruits, vegetables, grains, bark roots, stem, flowers, tea and wine [2]. These natural products were known for their beneficial effects on health long before flavonoids were isolated as the effective compounds. More than 4000 varieties of flavonoids have been identified, many of which are responsible for their attractive colors of flowers, fruits and leaves [3].

In view of this, the present study has been taken to determine the antioxidant potential and anti-inflammatory effects of questin, to elucidate it as a potential drug for various ailments.

MATERIALS AND METHODS

Qucertin compound was purchased from Sigma Aldrich, USA and used for the present study.

In vitro antioxidant activity

ORAC assay

The antioxidant potential of qucertin was determined by ORAC assay following the methods of Huang *et al.* (2002, 2005) [4, 5].

In vitro Anti-inflammatory activity

Membrane stabilization assay

Qucertin was subjected to human red blood cell (HRBC) membrane stabilization method to study the anti-inflammatory activity according to the method of Gandhidasan *et al.* (1991) [6].

RESULTS

In vitro antioxidant activity

Table-1 presents the data on antioxidant potential of qucertin when tested with ORAC assay. The data reveals that rutin has antioxidant potential, as the value of Net Relative Fluorescence Unit (NRFU) increased with an increase in the concentration of the drug. The NRFU values are Maximum at 100 µM (75.77+0.047) and decreases as the concentration is increased further.

Similarly when DPPH assay of qucertin was carried out, among all the concentrations of rutin, 12.5 µM showed the maximum % DPPH inhibition (Table-2).

The results indicate that qucertin has antioxidant potential and can be used as a drug for combating various ailments.

Table 1: ORAC Assay for Qucertin in different concentrations

S. No.	Concentration of qucertin (µM)	Net relative fluorescence unit
1	12.5	49.7+0.808
2	25	69.44+0.074
3	50	73.32+0.038
4	100	75.77+0.047
5	200	69.7+0.027

Values are mean+SE of six individual observations.

Table 2: DPPH Assay of Qucertin

S. No.	Concentration of Qucertin (µM)	% DPPH inhibition
1	12.5	0.294+0.003
2	25	0.148+0.047
3	50	0.079+0.041
4	100	0.077+0.160
5	200	0.070+0.050

Values are mean+SE of six individual observations.

Table 3: Haemoprotective activity of Qucertin

S. No.	Concentration of Qucertin (µM)	% Protection
1	62.5	97.348+0.370
2	125	62.219+0.907
3	250	97.028+0.140
4	500	96.896+0.252
5	1000	96.967+0.121

Values are mean+SE of six individual observations.

Haemoprotection of qucertin

When qucertin was tested for its hemoprotective activity, the per cent hemoprotection was directly proportional to concentration; the values being 97.348+0.370 at 62.5 µM and 96.967+0.121 at 1000 µM (table 3). The results thus reveal us that qucertin has hemoprotective effect.

DISCUSSION

According to Meena *et al.* (2008) [7], more than 2000 flavonoids have been reported among woody and non-woody plants [8]. Biosynthesis, isolation techniques and preparative chromatography [9], TLC, UV and IR spectral studies have provided new dimensions to the chemistry of flavonoids to such an extent that their presence have become important taxonomically [10]. Presence of flavonoids has been reported from many plant species like *Lycium barbarum* [11]; *Passiflora plamer* [12]; *Cassia angustifolia* [13]; *Jatropa curcas* L.[14].

Quercetin has been reported from many plant species like *Cicer arietinum* Linn. [15] and *Acacia catechu* [16]. As mentioned earlier, since quercetin has anti-inflammatory, antioxidant and anticancer properties,isolation and extraction of this compound *in vivo* (leaf, stem, fruit, root) and *in vitro* callus from *Citrullus colocynthis* and its enhancement by addition of elicitors in culture, can be exploited further for largescale production of this medicinally important compound [7].

The antioxidant activity of quercetin is well known as it possesses a suitable structure for free radical scavenging and ion chelation. However, the results of the TBARS assay indicate that unlike galangenin, both analogues do not show significant antioxidant activity. This may be due to the presence of an additional 5–OH group in galangenin generating a structure for effectively scavenging the free radical. Absence of 5–OH group in Q–Cl and Q–OCH3 leads to a drop in the antioxidant activity. Quercetin is also known to chelate iron, which is responsible for the production of free radicals. The chelation involves 3', 4'-hydroxy groups thus highlighting the importance of the catechol-like moiety [17].

CONCLUSION

The results show that qucertin seems to be a good replacement for chemical therapeutic drugs as it has antioxidative and anti-inflammatory properties.

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CONFLICT OF INTERESTS

Declared None.

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