



MENU

Results for FLAVONOIDS AS ... >

Flavonoids as Antidiabetic and Anti-Inflammatory Agents: A Review on Stru...



Flavonoids as Antidiabetic and Anti-Inflammatory Agents: A Review on Structural Activity Relationship-Based Studies and Meta-Analysis

[Are you this author?](#)

By Shamsudin, NF (Shamsudin, Nur Farisya) ; Ahmed, QU (Ahmed, Qamar Uddin) ; Mahmood, S (Mahmood, Syed) ; Shah, SAA (Shah, Syed Adnan Ali) ; Sarian, MN (Sarian, Murni Nazira) ; Khattak, MMAK (Khattak, Muhammad Muzaffar Ali Khan) ; Khatib, A (Khatib, Alfi) ; Sabere, ASM (Sabere, Awis Sukarni Mohmad) ; Yusoff, YM (Yusoff, Yusnaini Md) ; Latip, J (Latip, Jalifah)

[View Web of Science ResearcherID and ORCID](#) (provided by Clarivate)

Source INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES
Volume: 23 Issue: 20
DOI: 10.3390/ijms232012605

Article Number 12605

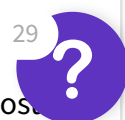
Published OCT 2022

Indexed 2022-11-13

Document Type Review

Abstract Flavonoids are a group of naturally occurring polyphenolic secondary metabolites which have been reported to demonstrate a wide range of pharmacological properties, most

29



importantly, antidiabetic and anti-inflammatory effects. The relationship between hyperglycaemia and inflammation and vascular complications in diabetes is now well established. Flavonoids possessing antidiabetic properties may alleviate inflammation by reducing hyperglycaemia through different mechanisms of action. It has been suggested that the flavonoids' biochemical properties are structure-dependent; however, they are yet to be thoroughly grasped. Hence, the main aim of this review is to understand the antidiabetic and anti-inflammatory properties of various structurally diverse flavonoids and to identify key positions responsible for the effects, their correlation, and the effect of different substitutions on both antidiabetic and anti-inflammatory properties. The general requirement of flavonoids for exerting both anti-inflammatory and antidiabetic effects is found to be the presence of a C2-C3 double bond (C-ring) and hydroxyl groups at the C3', C4', C5, and C7 positions of both rings A and B of a flavonoid skeleton. Furthermore, it has been demonstrated that substitution at the C3 position of a C-ring decreases the anti-inflammatory action of flavonoids while enhancing their antidiabetic activity. Correlation is discussed at length to support flavonoids possessing essential pharmacophores to demonstrate equipotent effects. The consideration of these structural features may play an important role in synthesizing better flavonoid-based drugs possessing dual antidiabetic and anti-inflammatory effects. A meta-analysis further established the role of flavonoids as antidiabetic and anti-inflammatory agents.

Keywords

Author Keywords: flavonoids; antidiabetic; anti-inflammatory; structure-activity relationship study; correlation

Keywords Plus: ALPHA-GLUCOSIDASE INHIBITION; NITRIC-OXIDE PRODUCTION; MACROPHAGE CELL-LINE; RAW 264.7; IN-VITRO; REQUIREMENTS; INFLAMMATION; MECHANISMS; TARGETS

Addresses

¹ Int Islamic Univ Malaysia, Kulliyah Pharm, Dept Pharmaceut Chem, Drug Discovery & Synthet Chem Res Grp, Kuantan 25200, Pahang, Malaysia

² Univ Malaya, Fac Pharm, Dept Pharmaceut Technol, Kuala Lumpur 50603, Selangor, Malaysia

³ Univ Malaysia Pahang UMP, Fac Engn Technol Chem, Dept Pharmaceut Engn, Gambang Campus, Pekan 26300, Pahang Malaysia

 ⁴ Univ Teknol MARA, Fac Pharm, Cawangan Selangor
Kampus Puncak Alam, Bandar Puncak Alam 42300, Selangor,
Malaysia

 ⁵ Univ Teknol MARA, Atta Ur Rahman Inst Nat Prod
Discovery AuRIns, Cawangan Selangor Kampus Puncak Alam,
Puncak Alam 42300, Selangor, Malaysia

[...more addresses](#)

Categories/ Classification

Research Areas: Biochemistry & Molecular Biology; Chemistry

Citation [3 Agriculture, Environment & Ecology](#) [3.16](#) [3.16.28](#)
Topics: [Phytochemicals](#) [Antioxidant Activity](#)

Sustainable Development Goals: [03 Good Health and Well-being](#)

Web of Science Categories

Biochemistry & Molecular Biology; Chemistry, Multidisciplinary

[+ See more data fields](#)

Citation Network

In Web of Science Core Collection

112

Citations

67

Cited References

Use in Web of Science

11

Last 180 Days

79

Since 2013

This record is from:

Web of Science Core Collection

- Science Citation Index Expanded (SCI-EXPANDED)

Suggest a correction

If you would like to improve the ²⁹