



Contents lists available at ScienceDirect

## European Journal of Medicinal Chemistry

journal homepage: <http://www.elsevier.com/locate/ejmech>

## Review article

## Pterocarpan scaffold: A natural lead molecule with diverse pharmacological properties

Chelliah Selvam<sup>a,\*</sup>, Brian C. Jordan<sup>a</sup>, Sandhya Prakash<sup>b</sup>, Daniel Mutisya<sup>c</sup>,  
Ramasamy Thilagavathi<sup>b,\*\*</sup><sup>a</sup> Department of Pharmaceutical Sciences, College of Pharmacy and Health Sciences, Texas Southern University, Houston, TX 77004, USA<sup>b</sup> Department of Biotechnology, Faculty of Engineering, Karpagam University, Coimbatore, India<sup>c</sup> Department of Science and Mathematics, Darton State College, Albany, GA 31707, USA

## ARTICLE INFO

## Article history:

Received 21 December 2016

Received in revised form

12 January 2017

Accepted 13 January 2017

Available online 17 January 2017

## Keywords:

Pterocarpan

Natural product chemistry

Pharmacological activity

## ABSTRACT

Phytoalexins are substances produced by plants that act as potent inhibitors of pathogens. Pterocarpan are biologically active isoflavonoids most commonly found in the family Fabaceae that have the ability to act as phytoalexins. It is made up of a tetracyclic ring system possessing benzofuran-benzopyran. A very great number of pterocarpan have been isolated from natural sources and they are proved to have significant biological activities such as anti-microbial, anti-cancerous, anti-inflammatory and anti-malarial activities. Recently, pterocarpan gained lot of attention because of the broad range of anti-cancer activities in various cancer cell lines such as breast, leukemia, cervical, lung, colon and melanoma. Interestingly, pterocarpan exhibited inhibitory potency against many enzymes such as PTP1B, Neuraminidase, and  $\alpha$ -glycosidase. In addition, they were shown to have anti-estrogenic and anti-diabetic activities. This review is a comprehensive inventory of the structures and sources of pterocarpan and it emphasizes on the biological evaluations of pterocarpan from various plant sources and their scope as a lead molecule.

Published by Elsevier Masson SAS.

## Contents

1. Introduction .....	219
2. Anticancer activity .....	220
3. Antioxidant and anti-inflammatory activity .....	226
4. Antimalarial activity .....	228
5. Antimicrobial and antifungal activity .....	231
6. Activity on neuraminidase and melanin synthesis .....	232
7. Anti-osteoporotic activity .....	232
8. Estrogenic, anti-estrogenic and anti-diabetic activity .....	233
9. Structure-Activity relationship (SAR) .....	233
10. In vivo studies .....	234
11. Conclusion .....	234
Acknowledgements .....	234
Abbreviations .....	234
References .....	235

\* Corresponding author.

\*\* Corresponding author.

E-mail addresses: [chelliahst@tsu.edu](mailto:chelliahst@tsu.edu) (C. Selvam), [thilagavathi@yahoo.com](mailto:thilagavathi@yahoo.com) (R. Thilagavathi).

## 1. Introduction

Plant based compounds provide diverse scaffolds in the discovery of novel lead compounds [1,2]. Globally, the overall