



## **“DORIVOR O‘SIMLIKLARNI YETISHTIRISH VA ULARDAN FOYDALANISHNING DOLZARB MASALALARI” MAVZUSIDAGI O‘ZBEKISTON – XITOIY XALQARO SIMPOZIUMI MATERIALLARI TO‘PLAMI**



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## PROCEEDINGS OF UZBEKISTAN-CHINA INTERNATIONAL SYMPOSIUM ON "CURRENT ISSUES IN THE CULTIVATION AND UTILIZATION OF MEDICINAL PLANTS"



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4. J. A. Rather et al., "An overview on analytical methods for estimation of piperine in various matrices," Trends in Food Science & Technology, vol. 112, pp. 541–555, 2021.

## **ISATIN–DERIVED COMPOUNDS CONTAINING ANTICANCER THERAPEUTICS**

**Mohd Faiyyaz<sup>1</sup>, Iqbal Azad<sup>1,\*</sup> Abdul Rahman khan<sup>1</sup>**

<sup>1</sup>Department of chemistry, Integral University, Lucknow–  
226026, India

Corresponding email: [mfaiyyaz@student.iul.ac.in](mailto:mfaiyyaz@student.iul.ac.in)  
[Iazad@iul.ac.in](mailto:Iazad@iul.ac.in), [arahman@iul.ac.in](mailto:arahman@iul.ac.in)

**Abstract.** Isatin (1H-indole-2,3-dione) structurally is a unique nitrogen containing heterocyclic ring system; because of its diverse nature and general pattern of biological activity, it has gained much attention in the field of anticancer drug research. This overview is centered on the value of isatin-heterocyclic hybrids as a useful platform for the design of novel anti-cancer drugs that, apart from having fewer side effects, might also counteract drug resistance. It covers their synthetic methods and modes of action Mostly apoptosis through the inhibition of kinases. Chemically altered isatin proved to be a brilliant tool in the creation of potent isatin hybrids and conjugates which can target multiple cancer pathways. Mention should be made of Really the isatin-hybrids not only showed anti-cancer effects against different cancer cells like breast liver colon, lung, and multidrug-resistant carcinoma cells but also their methods of action are mitochondrial-mediated apoptosis, caspase activation, tubulin polymerization inhibition, and kinase modulation, Mainly VEGFR-2 EGFR CDK2, and STAT-3. Several synthesized isatin-based compounds have demonstrated more potent cytotoxicity than the currently used chemotherapeutic agents with their IC<sub>50</sub> values, Besides causing low toxicity to the normal cells.

Keyword: isatin, anticancer

## **NATURAL PRODUCT INSPIRED NOVEL FLAVONES: MULTI-TARGET AGENTS FOR COMPLEX DISEASES**

**Mantash Mirza<sup>1</sup>, Wahajul Haq<sup>1,2</sup>, Abdul Rahman Khan, Khujamshukurov N.A<sup>3</sup>,  
Jamal Akhtar Ansari<sup>1,2\*</sup>**

<sup>1</sup>Department of Chemistry, Integral University, Lucknow 226026, Uttar Pradesh, India

<sup>2</sup>Central Instrumentation Facility, Integral Centre of Excellence for Interdisciplinary Research, Integral University, Lucknow 226026, Uttar Pradesh, India

<sup>3</sup> Department of Biotechnology, Tashkent Institute of Chemical Technology, Tashkent, Uzbekistan. 100011

Place of study: Department of Chemistry, Integral University, Lucknow

**\*Corresponding author:** [jamalakahtarindia@gmail.com](mailto:jamalakahtarindia@gmail.com), [jamalakhhtar@iul.ac.in](mailto:jamalakhhtar@iul.ac.in)

**ABSTRACT.** Natural products obtained from plants and other natural sources have been used for many years to help prevent and treat different health problems. Even today, these natural products continue to guide scientists in the search for new medicines. Flavones are one such group of natural products that are commonly found in fruits, vegetables, herbs, and many medicinal plants. They are known for several beneficial effects on health, such as protecting the body from harmful substances, reducing inflammation, fighting germs, supporting brain health, and helping protect against certain diseases, including cancer. Because of these useful properties, flavones have become an important area of research for developing new and improved medicines.

The concept of natural product-inspired novel flavones involves the design and synthesis of new flavone derivatives based on structural features found in nature. By making small changes in the basic structure of flavones, scientists try to improve their medicinal value and make them work better in the body. These changes can help the compounds become more effective and useful for treating different health problems. As a result, several new flavone derivatives have been developed that show better results against a variety of diseases, such as cancer, brain-related disorders, heart diseases, and infections caused by harmful microorganisms.

In recent years, improvements in laboratory methods and research techniques have helped scientists discover many new flavone compounds. These newly developed flavones keep the useful properties of naturally occurring flavones while showing better performance in the body. They may work more effectively and reach their target areas more easily than some natural flavones. Because of these advantages, flavone derivatives inspired by natural products are gaining attention as promising compounds for the development of safer and more effective medicines for various diseases.

This work shows how natural compounds can provide useful ideas for developing new medicines. It also explains the increasing importance of newly designed flavone compounds in medical and pharmaceutical studies. Further research on flavones may help scientists find better and more effective ways to prevent and treat different diseases, ultimately improving human health and quality of life.

Many health problems such as memory-related disorders, cancer, diabetes, and heart diseases do not develop because of a single cause. They occur due to several changes taking place in the body at the same time. Novel flavones have shown the ability to act in different ways by helping to reduce harmful substances in the body, lowering inflammation, protecting healthy cells from damage, and supporting the normal functioning of various organs. Because of these multiple beneficial effects, they are considered promising compounds for the management of complex diseases.

**Introduction.** Natural products have been used for many years as a source of medicines and health-promoting compounds. Many of the drugs available today were originally discovered from substances found in nature. Among these natural compounds,

Flavones are natural compounds found in many fruits, vegetables, herbs, and medicinal plants. For a long time, they have been valued for their health-promoting properties and are known to support overall well-being in different ways. Studies have shown that these compounds may help protect the body from damage caused by harmful substances, reduce inflammation, and support the normal functioning of various organs. Because of these beneficial effects, flavones have become an area of growing interest among researchers looking for new ways to improve health and manage different diseases. Their presence in commonly consumed foods and traditional medicinal plants further highlights their importance in scientific and pharmaceutical research. Many naturally occurring flavones have shown useful medicinal properties. Building on these natural structures, scientists have developed new flavone derivatives that may offer better therapeutic benefits and help address a wide range of health conditions.

In recent years, researchers have developed many new flavone compounds by making small changes to naturally occurring flavones. These newly prepared compounds have shown encouraging effects in studies related to cancer, brain disorders, heart-related diseases, diabetes, and infections caused by microorganisms. The continued interest in flavones is mainly due to their wide range of beneficial properties and their potential to contribute to the development of better treatment options for various health conditions. As a result, flavones remain an important subject of study in medicinal and pharmaceutical research.

**Research Methodology.** For this review, published literature related to novel flavones was collected from Google Scholar, SciFinder, ResearchGate, and ScienceDirect. Relevant research papers describing the synthesis of flavones and their biological applications were studied and compiled. The available information was then organized and summarized to present recent developments in this area of research.

Literature was surveyed using keywords such as “flavones”, “novel flavone derivatives”, “natural product-inspired flavones”, “flavone synthesis”, “biological activities of flavones”, “neuroprotective flavones”, and “antimicrobial flavones”. Relevant journal articles and review papers were collected, read, and used to gather information related to the synthesis and biological activities of flavones.

The literature was reviewed with a focus on the synthesis of novel flavones and their biological activities. Information from various published studies was collected, examined, and organized to provide an overview of recent developments in flavone research.

**Results and Discussion.** The literature survey showed that various methods have been used for the preparation of flavone derivatives. These methods have helped in obtaining a wide range of flavones with important biological properties. The commonly reported methods are as follows:

- **Synthesis via Chalcones:** A commonly used approach for preparing flavones involves first obtaining chalcone compounds and then converting them into flavones through suitable reaction conditions.

- **Algar–Flynn–Oyamada (AFO) Method:** This method converts chalcone compounds into flavones derivatives using a simple oxidation process. It is widely used for the preparation of flavonoid compounds that are important in medicinal and pharmaceutical research.

- **Iodine-Mediated Cyclization:** In this method, iodine is used to convert chalcones into flavones under simple reaction conditions, giving the desired products in good amounts.

- **Acid-Catalysed Cyclization:** A simple method in which suitable chalcones are transformed into flavones under acidic conditions, giving the desired compounds in good yield.

The reviewed studies show that these methods have been widely used to prepare new flavone compounds. Small changes in the flavone structure have helped improve their biological properties, and many of the reported compounds have shown useful activities such as antioxidant, anti-inflammatory, antimicrobial, anticancer, and neuroprotective effects. These findings highlight the importance of continuing research on flavone synthesis for the development of potential therapeutic agents.

**Conclusion.** On the basis of literature surveyed it is concluded that Flavones developed from natural compounds are considered promising for treating complicated diseases because they can work on different problems within the body at once. Their ability to provide multiple beneficial effects may help improve treatment outcomes and support overall health.

### References

1. Kumar, S., Pandey, A.K. (2013). Chemistry and biological activities of flavonoids: An overview. *The Scientific World Journal*, 2013, 162750.
2. Panche, A.N., Diwan, A.D., Chandra, S.R. (2016). Flavonoids: An overview. *Journal of Nutritional Science*, 5, e47.
3. Singh, M., Kaur, M., Silakari, O. (2014). Flavones: An important scaffold for medicinal chemistry. *European Journal of Medicinal Chemistry*, 84, 206–239.
4. Keri, R.S., Budagumpi, S., Pai, R.K., Balakrishna, R.G. (2014). Chromones as a privileged scaffold in drug discovery: A review. *European Journal of Medicinal Chemistry*, 78, 340–374.
5. Heim, K.E., Tagliaferro, A.R., Bobilya, D.J. (2002). Flavonoid antioxidants: Chemistry, metabolism and structure–activity relationships. *The Journal of Nutritional Biochemistry*, 13(10), 572–584.
6. Cushnie, T.P.T., Lamb, A.J. (2005). Antimicrobial activity of flavonoids. *International Journal of Antimicrobial Agents*, 26(5), 343–356.
7. Zhuang, C., Zhang, W., Sheng, C., Zhang, W., Xing, C., Miao, Z. (2017). Chalcone: A privileged structure in medicinal chemistry. *Chemical Reviews*, 117(12), 7762–7810.