



Pharmacognosy analysis of bioactive compounds of *Indigofera tinctoria* linn. (Fabaceae) by using GC-MS

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Abstract

The ethanolic and hexane extracts of *Indigofera tinctoria* Linn. Fabaceae leavers growing in Thiruvannamalai district, South India were subjected for pharmacognosy analysis of bio-active compounds by using GC-MS method. The ethoanolic leaf extract showed the presence of fourteen chemical compounds in this, mom inosital 41.74%, plamitic acid 6.93%, phytol 8.26%, alpha-linolenic acid 22.60% are in considerable proportion and have medicinal values.

Keywords: pharmacognosy, bio-active compounds, *Indigofera tinctoria*, ethanol, hexane

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Introduction

Plant and its derivatives are the main source of food for mankind. It also provides medicines charaka, The Father of Ayurvedic Medicine. Sushruta, bhagvatta gave importance to medicinal plants. The Tamil Nadu forest department assembled 324 medicinal plants so far. In the absence of modern medicinal remedies peoples depend on herbal remedies derived from plant and spices. Extraction of several active phytocompounds form green factories has given birth to some high activity profile drugs (Mandal et al., 2007) and the use of traditional medicine is wide spread in India (Jeyachandran and Mahaesh, 2007). Approximately 25% of the modern Medication is developed from plants (Earnsworth et al., 1985). Since the time immemorial our traditional system of medicine and folklore claiming the medicinal plants as whole or their parts are being used for all types of diseases. In India, folklore Medicines play an important role in to health care system.

Indigofera tinctoria Linn. is distributed in south and south East Africa, Tropical Africa and is introduced in Tropical America. In India it is a cosmopolitan species. It belongs to Family, Fabaceae. It is a deciduous shrub that grows from 1-2 m tall. It is a nitrogen fixing legume used in crop rotation for replenishes the soil. Indigo dye was popular item international commerce. *Indigofera* roots and leaves are used for epilepsy and hydrophobia. Dry leaf powder is used in the treatment of asthma (Savithramma and Rao, 2007). Nili is a repeated drug produced from this plant is used in Ayurveda for the promotion of hair growth (Joy

et al., 1998). Decoction of the leaves used in bites and stings or venomous insects and reptiles to relieve the pain (Degeudies et al., 2003; Stepp, 2004). Reported the whole plant contains glycoside, indicom, indigotine, indirubin and glalctomannan. Plants contain several phyto chemicals which possess strong antioxidant activities (Senthil Kumar and Venkatesalu, 2009). The antioxidant plays an important role in ailments, Such as heart diseases, cancer, diabetes, hypertension stroke and Alzheimer's disease. Researchers are expecting new molecules form herbs to fight against the cancer (Shoeb, 2006). Thus, plants have lot of medicinal properties that is used for human beings as drugs.

Materials and Methods

Collection of Plant material

Indigofera Tinctoria Linn. was collected form Arni, Thiruvannamalai District, Tamil Nadu, India. The collected plant was carefully examined and identified with the help of Flora of the Presidency of Madras (Gamble, 1954).

Extraction of Plant material

Hexane and ethanolic extracts of *Indigofera tinctoria* Linn. to the methodology of Indian pharmacopoeia (Anonymous, 1966). The leaves were washed in running tap water and dried in shadow and subjected to soxhelt extraction. 20 gms of leaf powder was extracted with hexane and ethanol by using soxhelt apparatus for 24 hrs. The extracts were filtered and evaporated until dryness. The extracts were stored in air tight containers and kept in refrigerator at 4°C for further investigation.

The hexane extract of Indigofera tinctoria

Leaf extracts revealed 21 chemical compounds. In that palmitic acid 11.03%, alpha-linolenic acid 47.03%, all-trans-squalene 2.19%, di-alpha-tocopherol 2.56%, stigmasterol 2.37% are main constituents and have medicinal uses. In ethanolic leaf extract mom inositol is very high. It is a part of vitamin B-complex. It helps in hair growth, nerves transmission and limit the body and intestinal bacterial quantity. Alpha linolenic acid is used for cardiovascular disease. It is needed for human growth, prevents heart attack and lower the high blood pressure and is used rheumatic arthritis, diabetes, renal disease, skin cancer and depression. Alpha-tocopherol is otherwise called vitamin E. It protects the body against tissue damage. And protect against heart is a fatty acid and is used in cosmetics. Phytol is essential for activating enzymes for the production of insulin. It also decreases the blood cholesterol. All-trans-squalene shows antitumour activity, stigmasterol can be used to make synthetic progesteron.

Ethanolic extract of Indigofera tinctoria

The ethanolic extract of *Indigofera tinctoria* Linn. was subjected to GC-MS analysis. In this analysis 14 compounds were identified (Table 1) in that 1,3-propanediol 4.58%, mom inositol 41.74%, neophytadine 5.10%, palmitic acid 6.93%, phytol 8.26%, alpha-linolenic acid 22.60%, stigmasterol 2.44% other compounds present in very small quantities. The peak leaves of different compounds are shown in fig. 1.

Hexane extract of Indigofera tinctoria

The hexane extract of *Indigofera tinctoria* Linn showed 21 chemical compounds (Table 2) from that palmitic acid 11.03%, phytol 3.94%, alpha-linolenic acid 47.03%, all-trans-squalene 2.19%, n-tetra tricontane 5.93%, tetra contanediol 4.53%, dlalpha-Tocopherl 2.56%, 1.30-tria contanediol 4.87%, stigmasterol 2.37%, 1 heptacosonal 5.28% are in considerable proportion. Rest of them is meagre proportion. The peak reports of this Bio-active compounds were given in fig. 2.

Discussion

The pharmacognosy analysis of bio-active compounds in ethanolic and hexane extracts of *Indigofera tinctoria* Linn. leaves by GC-MS analysis.

Ethanolic extract of Indigofera tinctoria

In this extract mom-inositol is 41.74%. It is a part of vitamin B-Complex. It helps in hair growth, never transmission and limits the body and intestinal bacterial quantity. Dosage of inositol for men 1000 mg, women 1000 mg, children 550 mg, Inositol has no toxic effect but induce diarrhea when in take very high dosage. Alpha-Linolenic acid is 22.60%. It is first isolated in seeds (Rollet, 1909). It is used for cardio vascular disease. It is needed for human growth, prevents heart attack and lower the high blood pressure and is used in rheumatic arthritis, diabetes, renal disease, skin cancer, depression etc. Alpha-tocopherol (1.67%) and stigma sterol (2.44%) are in low proportion tocopherol is otherwise called vitamin E it protects the body against tissue damage and control the cholesterol content. In *Indigofera tinctoria* Linn. isolated tocopherol and β -sistosterol from leaves (Shah et al., 1997). All-trans-squalene (Triterpene) is only 1.34%. It shows antitumour activity. It protects against several carcinogens (Senthil kumar et al., 2006). Stigmasterol (a triterpenoide) can be used to make synthetic progesterone. It has also wound healing effect. Phytol is useful for production of insulin and decrease the blood cholesterol. Palmitic acid is 6.93% it is used in cosmetics.

Hexane extract of Indigofera tinctoria

Though it has 21 compounds, the major proportion of chemical compounds are alike Ethoanolic extract. Alpha-linolenic acid is 47.03% so it is very useful for heart disease. Palmitic acid is 11.03%. It is more useful them ethanolic extract (6.93%) in cosmetics most of the chemical compounds have no medicinal values.

Conclusion

The chemical compounds identified in *Indigofera tinctoria* Linn. Leaf extracts of ethanol and hexane by GC-MS method. Ethanol extract showed 14 compounds but hexane extracts showed 21 compounds. Mom inositol (41.74%) is absent in hexane extract. Alpha-linolenic acid is 47.03% in hexane but it is 22.60% in ethanol extract most of the major compounds are like in both extracts. So ethanol extract contains mom-insitol in high proportion (vitamin B-complex) helps in hair growth, nervestransmission and limit the body and intestinal bacterial quantity. In conclusion, hexane extract is more useful than Ethanol extract in having alpha-linolenic acid 47.03%. It is essential for human

growth and lowers the high blood pressure and is useful in diabetes, renal diseases.

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