Short Communication

PHYTOCHEMICAL INVESTIGATION OF LEAVES OF *PINUS WALLICHIANA*

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Abstract

In the current phytochemical investigation an effort was made to explore phytochemicaly the leaves of *Pinus wallichiana*, which in turn resulted in to the isolation of four new source phytochemical constituents. The structures of all these compounds were established by using advance spectroscopic techniques including IR, UV, NMR, 1D, 2D and Mass techniques.

Key words- Phytochemical investigation, chemical constituents, *Pinus wallichiana*.

INTRODUCTION

*P. wallichiana* locally known as ‘chil’ (in Pashto), kairo (in Urdu), blue-pine (in English) is widely spread in various regions of Pakistan such as Rawal pindi, Islamabad, Baltistan, Basho forest, Skardu, Hazara Distt, Bara Gali, Changla gali, Mokhspuri and Kashmir. The *Pinus wallichiana* is also widely distributed in Afghanistan, Himalaya from Chital Eastward to West Nepal. It is a tall tree 20 to 25 m or more. The leaves are 12 to18 cm long with fascicles nature. The fruits are founds in the form of cones 8 to 12 cm long and slenderer shape".
Material and methods

The leaves (20 kg) were air shade dried, powdered and extracted with 5% aqueous methanol for one week (x 3). The combined extract was filtered and concentrated by a vacuum rotary evaporator to obtained greenish residue F1 (4.7 kg), which was partitioned with n-Hexane afforded n-Hexane soluble fraction F2 (1.5 kg). The n-Hexane insoluble fraction F3 (3.1 kg) which was further partitioned with ethyl acetate afforded ethyl acetate soluble fraction FX3 (1 kg). The aqueous fraction remained on further fractionation with chloroform resulted in to three fractions, solid residue FX4A (0.5 kg), water FX4B (0.4 kg) and the chloroform fraction FX4C (0.7 kg) respectively. The chloroform fraction FX4C (500 g), was subjected to column chromatography on silica gel eluted with n-Hexane-chloroform with increasing polarity of gradient solvent to obtained (A-F) sub fractions. The fraction A and B were oily in nature, while C, D and E were combined on the basis of TLC profile and rechromatographed using silica gel afforded 20 sub fractions (1-20) using chloroform-methanol solvent system with increasing. The sub fraction 13-15 (4 g) were compiled and rechromatographed on silica gel using chloroform-methanol with increasing polarity and purified by using prep TLC resulted into four pure compounds 1 (30 mg), 2 (26 mg), 3 (14 mg) and 4 (13 mg).

Results and discussion

The leaves of *Pinus wallichiana* were phytochemically investigated which result in to four new source compounds. \(\beta\)-Sitosterol (1)\(^1\)\(^2\), \(\beta\)-Sitosterol 3-O-\(\beta\)-D-glucopyranoside (2)\(^1\)\(^2\), 5-Hydroxy-7-methoxy-2-(4-methoxy phenyl)-4H-chromen-4-one (3)\(^3\)\(^4\), Oleanolic acid (4)\(^5\)\(^6\).

![Chemical structure of compound 1](image1.png)

![Chemical structure of compound 2](image2.png)

![Chemical structure of compound 3](image3.png)
The structures of all these compounds were established by using advance spectroscopic techniques. The NMR data of these new source compounds were compared with the available literature and proven to be exactly matched.

**CASE STUDY**

In the present study, an effort was made to scientifically validate all the chemical constituents present in the leaves of medicinal plant known as *Pinus wallichiana* to further elaborate its medicinal importance. A total of four phytochemical constituents have been isolated and characterized. The results obtained revealed that it contain variety of therapeutic reagents which further need to explore phytochemaly.

**CONCLUSIONS**

From the results above it is clear that the medicinal plant *Pinus wallichiana* possess high medicinal importance as clear from the previous literature and phytochemical constituents isolated in the current study. Further scientific approach is needed to explore phytochemaly this plant.

**REFERENCES**


