

Short Communication

PHYTOCHEMICAL INVESTIGATION OF LEAVES OF *PINUS WALLICHIANA*

**Taj Ur Rahman¹, Ghias Uddin², Wajiha Liaqat², Khair Zaman¹, Ghulam Mohammad,³
and Muhammad Iqbal Choudhary⁴**

¹Department of chemistry, Abdul Wali Khan University, Mardan, KPK, Pakistan

²Institute of Chemical Sciences, University of Peshawar, Peshawar 25120, K.P.K, Pakistan

³veternart health officer, Incharge, civil veterinary Hospital, Dir (L)

⁴International Center for Chemical and Biological Sciences, H.E.J. Research Institute of Chemistry, University of Karachi, Karachi-75270, Pakistan.

¹taj_urrehman81@yahoo.co.uk,

¹Kzaman@awkum.edu.pk

⁴www.cybernet@hej.pk

(Corresponding author: Taj Ur Rahman, Department of chemistry, Abdul Wali Khan University, Mardan, KPK, Pakistan. Email: Taj_urrehman81@yahoo.co.uk)

Abstract

In the current phytochemical investigation an effort was made to explore phytochemically 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.

Copyright © acascipub.com, all rights reserved.

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

INTRODUCTION

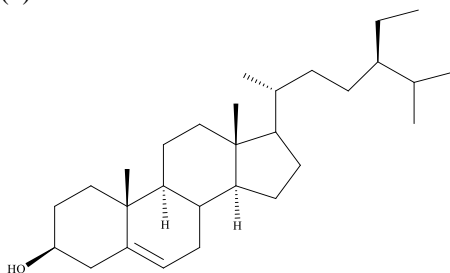
P. wallichiana locally known as 'chil' (in Pashtho), kairo (in Urdu), blue-pine (in English) is widely spread in various regions of Pakistan such as Rawal pindi, Islamabad, Baltistan, Basho forest, Skardu, Hazara Distt, Bara Gali, Changla gali, Mokhsperi and Kashmir. The *Pinus wallichiana* is also widely distributed in Afghanistan, Himalaya from Chitral Eastward to West Nepal. It is a tall tree 20 to 25 m or more. The leaves are 12 to 18 cm long with fascicles nature. The fruits are founds in the form of cones 8 to 12 cm long and slenderical shape³.

Material and methods

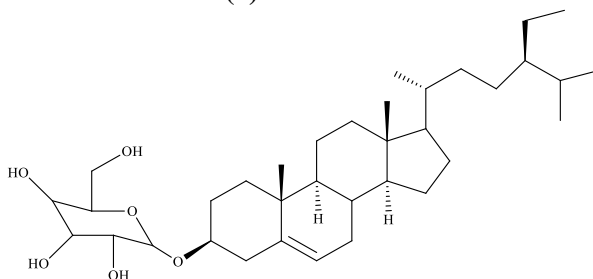
The leaves (20 kg) were air shade dried, powdered and extracted with 5% aqueous methanol for one week (x 3). The combined extract was filtered and concentrated by a vacuum rotary evaporator to obtained greenish residue **F1** (4.7 kg), which was partitioned with *n*-Hexane afforded *n*-Hexane soluble 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 **F3** (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

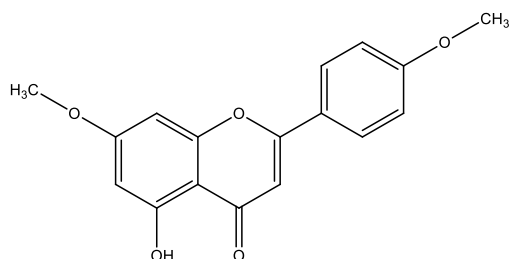
The leaves of *Pinus wallichiana* were phytochemically investigated which result in to four new source compounds. β -Sitosterol (**1**)¹⁻², β -Sitosterol 3-*O*- β -D-glucopyranoside (**2**)¹⁻², 5-Hydroxy-7-methoxy-2-(4-methoxy phenyl)-4H-chromen-4-one (**3**)⁴, Oleanolic acid (**4**)⁵⁻⁶.



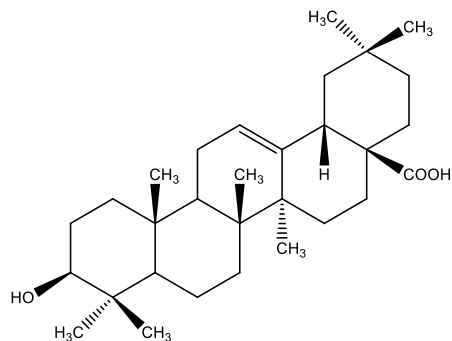
(1)



(2)



(3)



(4)

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 phytochemically.

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 phytochemically this plant.

REFERENCES

- [1] Ageta, H.; Ageta, T. (1984) *Chem. Pharm. Bull.*, 32, 369.
- [2] Basnet, P.; Kadota, S.; Terashima, S.; Shimizu, M.; Namba, T. (1993) *Chem. Pharm., Bull.*, 41, 1238.
- [3] Alya, M.; Ismat, N. S.; Zeb, A. N. (2011) *J. Med. Plants Res.*, 5, 5216.
- [4] Ahmad, V. U.; Rahman, A. U., (1994) *Hand book book of natural product data:Penta cyclic triterpenoids;* Elsvier; Amsterdam. 2, 1064.
- [5] Mei-Ing, C.; Jing, R. W.; Mei, H. L.; Ming, H. Y.; Nan, L. C. (1999) *J. Nat. Prod.*, 62, 1033.
- [6] Zahir, A.; Jossang, A.; Bernard, B.; Jean, P.; Jean, P. C. (1999) *J. Nat. Prod.*, 62, 241.