Short Communication

Pak. j. sci. ind. res., vol. 40, nos.5-12, May-December 1997

The Chemical Constituents of *Potamogeton pectinatus*

S.A. Majid Ayatollahi, Farzad Kobarfard, Hossein Komeylizade, Narges Aghareza Kashani, Nighat Afza* and Abdul Malik**

Shaheed Beheshti University of Medical Sciences, School of Pharmacy, Tehran, Iran.

(Received August 4,1995 revised November 23, 1996)

The genus *Potamogeton* belongs to the family *Potamogetonaceae* and comprises five species with interesting but diverse uses in folklore medicine. For instance *Potamogeton pectinatus L.* is used to relieve fever of the liver, while *P. javanicus Hassk* and *P. natans L.* are febrifuge and resolvent [1]. A decoction of *P. polygonifelius Pourr.*, with brown sugar, is ingested to treat dysentery; a simple decoction affords a treatment for toothache and eye diseases [1]. The medicinal properties of this genus have prompted us to carry out phytochemical studies on one of its species *P. pectinatus* which commonly occurs in various parts of East and Southeast Asia. The literature survey reveals that no individual constituent has ever been isolated from this species although some amino acids and carbohydrates have been identified through chromatography [2-3]. Herein we report the isolation and characterization of a new purine alkaloid and an aromatic diester from *P. pectinatus* collected form Oven Lake in Almoot District, Tehran.

The extraction of whole plant material of *P.pectinatus* (10 kg) was performed in EtOH three times. All EtOH extracts were combined and concentrated under reduced pressure to a gummy residue. This was acidified with 10% AcOH and extracted with EtOAc to remove non-alkaloidal components. The acidic aqueous fraction was then basified with NH_3 and extracted thoroughly with $CHCl_3$. The basic residue obtained from the $CHCl_3$ extract was subjected to preparative thin layer chromatography over silica gel G using EtO Ac-Me_2CO-BuOH-10% NH_3 (5:4:3:1) as eluent to obtain a pure alkaloid which on repeated crystallization with water melted at 272°C. The UV spectrum in $CHCl_3$ showed a maximum at 271nm (ξmax.1.04×10^4). The IR spectrum in KBr showed peaks at 3600 cm^{-1} (N-H stretch), 1700 and 1650 cm^{-1} (C=O stretch) and 1580cm (C=N stretch). The HREIMS showed molecular ion peak at *m/z* 180. 06475 consistent with molecular formula $C_7H_8N_4O_2$ (calcd. for $C_7H_8N_4O_2$ 180.06472). It also showed characteristic fragments 'a' at *m/z* 123 $[M\text{-}CONCH3]^+$, 'b' at 95 $[a\text{-}CO]^+$ and 'c' at *m/z* 68 $[b\text{-}HCN]^+$.

The 1H-NMR spectrum in deuteriodimethylsulfoxide showed 3H singlets at δ 3.37 and δ 3.17 (N-CH3), 1H singlet at δ 7.99 (C=C-H) and a broad peak at δ 6.6 (N-H). The physical and spectral data characterized the alkaloid as theophylline reported earlier from tea leaves [4-5].

Preparative thin layer chromatography of the neutral fraction over silica gel provided a uniform crystalline compound which melted at 140°C, showing M^+ peak in HREIMS at m/z 194.05787, consistent with molecular formula $C_{10}H_{10}O_4$ (calcd. 194.05790). The IR spectrum showed carbonyl stretching at 1720 cm^{-1}. It could be identified as dimethyl terephthalate through comparison of physical and spectral data with literature values [6].

*Pharmaceutical and Fine Chemicals Division, PCSIR Laboratories Complex, Karachi-75280.

**H.E.J. Research Institute of Chemistry, University of Karachi, Karachi-75270.

References

1. L.M. Perry, *Medicinal Plants of East and Southeast Asia,* (The MIT press, Massachusetts, U.S.A. 1980), p 330.
2. M. M. Ikramova, Izv. Akad. Nauk Tadzh. SSK, **4**, 112 (1974).
3. M.S. Dukin, I.V. Areshidze and G.D. Lukina, Rastit, Resur., **12**, 133 (1976).
4. Kosel, Chem. Ber.,**21**, 2164 (1888).
5. H. Michi and H.Haberler, Monatshefte Chem., **85**, 779 (1954).
6. J.B. Cohen and H.S. Penington, J. Chem. Soc., **113**, 63 (1918).