IOSR Journal of Applied Chemistry (IOSR-JAC)
e-ISSN: 2278-5736.Volume 9, Issue 3 Ver. I (Mar. 2016), PP 80-87
www.iosrjournals.org

Phytochemical composition of Diospyros melanoxylon seeds

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Abstract:
Diospyros melanoxylon is commonly called Tendu.The generic nameis derived from Greek dios meaning divine and pyros means fruit.The specific name is Greek and means dark wood.Mention has been made about the use of tree and its fruit in ayurvedic and unani texts.Fruits are available in summer season. These are sold locally by tribals.In the present communication ,we have under taken phytochemical investigation of seeds of Tendu to justify their nutritional and medicinal value.

Keywords: *Diospyros melanoxylon, Seeds, Phytochemical, composition, medicinal values.*

I. Introduction:

Diospyros melanoxylon belongs to family Ebenaceae. The tree is found in India in evergreen forests of Deccan ,Assam and Bengal. Most of the species are of great medicinal values .Seeds of D.peregrina and its oil are used in the treatment of dysentery and diarrhoea .Seeds of D. lotus are used as sedative in China. Crushed lives of the D.montana are used by mundas of Chotta Nagpur to poison fish(1). Parts of the plant is used for used for wrapping bidis.The fruit of the tree is a source of income for the tribals.Fruit contains 3-5 seeds which are dark brown in colour. Dried flowers are reported to be used in urinary,skin and blood diseases.The leaves of the plant are diuretic ,laxative and bark of the plant is astringent and its decoction is used in diarrhoea and dispensiaA dilute extract is used as an astringent lotion for eyes(2).

Phytochemical studies of leaves showed presence of lupeol and Alpha amyrin(3).From petroleum ether extract of the bark, betulinic acid, lupeolan unidentified terpene,7-methyljuglone were reported Lauric,myristic,palmitic,stearic,behenic,oleic, and linoleic acids were detected in the seed oil(4).Several naphthoquinones have been reported in the heart wood of the plant(5,6).

II. Experimental

Seeds of Diosporos melanoxylon were collected from forests of Chittorgarh divisions of Rajasthan. Powdered seeds were extracted with petroleum ether at 60-80 ° C on a boiling water bath for 36 hours. The yellow extract obtained ,first was concentrated after removal of solvent under reduced pressure .It was chromatographed over Brockmann neutral alumina .Elution was carried out with solvent of increasing polarity. Various fractions were collected and each fraction was purified by separative TLC using keisel gel PF 254Merck plates. Following compounds were identified in the seed extract of the plant:

III. Beta sitosterol:

Elution of column with petroleum ether benzene(1:1) afforded yellow solid (100 mg).It was crystallized from methanol chloroform (1:1) as shining flakes ,15 mg,melting point 136 -137° C.It gave positive TNM test for unsaturation, Lieberman -Burchard and Noller tests for sterols.Its infrared spectrum displayed important bands zat 3400broad(OHstretch)and1050(C-Ostretch) cm-1.Its identity was confirmed as beta sitosterol by preparation of its acetate,m.p.126-27°C and byCo-TLC and mixed m.p. with an authentic sample of beta sitosterol.

IV. Beta amyrin:

Elution of column with petroleum ether benzene (1:1)gave yellow solid (300 mg).It was crystallized from methanol as white needles, 150 mg melting point 185-86 °C Reported 186°(7) .It's elemental analysis and mass spectrometric studies established it's molecular formula as$C_{30}H_{50}O$.It gave deep red violet colour with Lieberman Burchard reagent and yellow colour changing to red with Noller reagent thus indicating unsaturated triterpenoidal nature of the compound. I.R .vmax(KBr)3350 (OH) 2940- 298 5(C-H), 1650(C =C),1384, 1370(C-(Me)2),1050(C-O) and 890 cms-1.Its identity as beta-amyrin was ascertained by preparation of its acetate,m.p.237-48°C.

Betulin: Elution of column with benzene ethyl acetate (3:1) gave yellowish brown solid (125 mg). It was crystallized from methanol as white needles melting point 248-49.° Reported m.p.254-56°. It gave test of unsaturated triterpenoids. Mass

spectrum revealed a molecular ion at m/z 442 corresponding to its molecular formula .Peaks at m/z 424 424 and 411 were due to loss of water and CH2OH moiety from molecular ion respectively. Its identification was further established by preparation of its diacetate ,melting point 215-16°[reported m.p 216 -17°)(8)

Betulinic acid

Elution of the column with benzenethyl acetate 1:1 gave yellow solid 150 mg. It was crystallized from methanol as white needles ,melting point316- 18°C(9). It gave single spot on TLC plate, answered Liebermann burchard and Noeller test indicating its triterpenoidal nature(10). Presence of COOH group was established by preparation of its methyester and by appearance of a broadband at 3300-2500 cm -1and 1710cm-1 in its I.R spectrum. Mass spectrum of its methyl ester showed molecular ion at 470 and base peak at 189 .Its identification was supported by preparation of methyl betulinate m.p. 221 – 24 ° C .(11)reported melting point (221 -24 °).

V. Results and discussion.

Plants have always been the source of phytochemicals.These are associated with variety of biological activities as antifungal, antibacterial, anti-inflammatory, antimicrobial, antitumour, antiviral, antidiabetic etc. The isolation of betulin, betulinic acid, amyrin supports the pharmacological use of this plant . (12,13)

VI. Conclusion

The use of this plant for various pharmacological properties needs to be further investigated.The consumption of these plants should be recommended in the diet.It will play a big role in the prevention and control of diseases.

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