

A New anthraquinone glycoside from root-bark of cassia absus Linn

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Abstract : Plants of Cassia genus belong to leguminosae family and has over 600 species. Many of them are sources of valuable medicinal compounds and are used as therapeutics. Cassia absus, a genus of this group was taken for analysis of constituents of its root-barks. So root-barks was obtained from J.P. Udyan Bodh Gaya. It was first cleaned, crushed, dried in shade and grinded then taken in soxhlet extractor with petroleum ether. Benzene and ethyl acetate successively. It was refluxed for twelve hours. Ethyl acetate turned yellowish colour. It was distilled in a R.B. flask and concentrated to small volume (10ml). It was column chromatographed in silica gel G and tested for homogeneity and purity by T.L.C. it was left overnight for cooling at room temperature. An orange coloured compound obtained m.p. 174°C. recrystallised in alcohol. Its molecular formula with determined by as usual method found to be $C_{23}H_{24}O_{11}$.

(Keywords: Acidic hydrolysis, Aglycone, chromic acid oxidation, Cassia absus root-barks, Glycoside, Hydrolysate)

Introduction

We know that plants are main sources for several thousand of drugs or discovered all over the world. The medical value of the plants is due to the presence of some Chemical constituents present in the plant tissues. The structural studies of natural products give due to under standing of biogenesis and chemosystematics. Genus cassia a vast and predominantly tropical occurring in equatorial and tropical regions belong to more than 600 species of laguminosae family.

Experimental

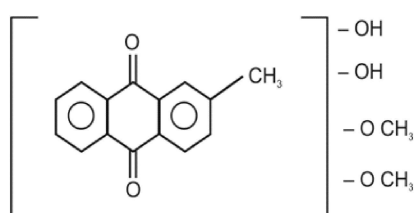
The compound on hydrolysis with 7% H_2SO_4 gave a product (Aglycone) Mol. Formula $C_{17}H_{24}O_6$, m.p 214°C. The hydrolysate was tested which showed the presence of a sugar moiety. The sugar formed an Osazone with 2:4 DNP and its structure corresponded to that of galactose. The PC of showed a spot $R_f = .16$ confirming the presence of galactose.

Thereafter aglycone was subjected to various standard colour reactions for identification. It produced green colour with $FeCl_3$ Solⁿ, showed the –OH (phenolic) group in the aglycone and did not produce pink colour with cericamm. nitrate showing the absence of alcoholic group. The aglycone tested for –OCH₃ group by Zeisel Method that gave the product AgI showing, that the aglycone has methoxy group also. The aglycone reduced with Zn/HCl and Zn/NaOH that hinted its anthraquinoid structure. It also responded +vely Feigl and Thomson's reactions that also supported its anthraquinoid structure.

Result and Discussion:

The aglycone on Zn-dust distillation yeilded a compound 2-methyl anthracenem.p. 206°C that slowed its basic skeleton with –OH and –OCH₃ as its functional groups. The IR of the aglycone showed peaks at 3400 cm^{-1} showing the presence of –OH groups and peaks at 2925 cm^{-1} and 1190 cm^{-1} hinted the presence of –OCH₃ groups in the aglycone.

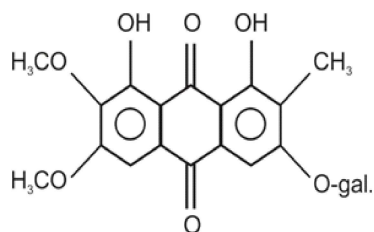
The number of –OH group was determined by weissenberger's method that yielded 28.10%. of acetyl product showing that it has three –OH groups. The number of –OCH₃ group was done by Zeisel's method that yielded. AgI 18.70% showing that it has two methoxy groups. Fixation of the position of –OH group and –OCH₃ groups was done by following colour reactions.



The aglycone was tested with 10%. Ethanolic KOH and formamidesolⁿ, a dark readcolour was produced showing presence of 1, 8–dihydroxy system in the aglycone. This was also by the peaks at 1670cm⁻¹ and 1630cm⁻¹ for chelated carbonyl groups. It did not produce violet colour with Conc. H₂SO₄. Showing the absence of 1, 5-dihydroxy system in it. A spot of ethanolic compound treated with glacial acetic acid and viewed under U.V Light, no fluorescene was seen. Have it has no 1,4 – dihydroxy systems. The

aglycone subjected to “Shibata et al” test pink colour was obtained that showed that the aglycon has 1, 3-dihydroxy system, but this test was not given by the glycoside, Hence it was concluded that position 3 of the aglycone considering the above outcomes, it can be considered that the two methoxyl groups must be at position 6 and 7 of this aglycone. This was further supported by demethylation of the aglycone by Zeisel's method and the product obtained gave the test of vicinal –OH groups where as the aglycone did not give the test, Hence the two –OCH₃ groups must be at positions 6 and 7.

Taking all the above results together. It was concluded that the glycoside has the following structure.



1,8dihydroxy 6,7- dimethoxy-2. methylanthraquinone 3-O- β -D(+)-Galactopyranoside.

Reference

1. The wealth of India Raw Material CSIR India Vol II. P- 93-94 (1950)
2. Smith Roger, M.Ali, N.Z. Sadaquet *J. Sci* 123 (1979)
3. J. Singh and J. J. Singh, *Planta Med* **6**, 120 1979 (525) (1985)
4. K.S. Sinha and R. Prasad, *Thesis M.U. Bodh Gaya*, (1989)
5. N.K. Yadava, and Balwant Ray *Yaswant Ph.D. thesis Chemistry* (1999).
6. N. K. Yadava and Sanjeev Kumar, *Ph.D Thesis M.U. BodhGaya* (2008).
7. Sanjeev Kumar and N. K. Yadava, *J. Chemtracks* **11** (1),195 (2009)
8. RH Thomson, *Naturally occuracyquinons Acad. press under Newyork* P57-59 (1971)
9. Sanjeev Kumar and N.K. Yadav *J. Chamtracks* **22** (1 & 2), 275 (2020)
10. Poonam Ojha & D.N. Thakur *J Chemtracks* **22** (1&2) 359, (2020)
11. P. Feigl *JUNGRESS Microchem* J-21, 216, (1959).
12. K.S. Sinha, *Journal of Bengladesh Academy of Science* Vol.10 (2), 203 (1986)

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