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# A NEW PYRIDINIUM ALKALOID FROM THE SEED EXTRACTS OF *ABRUS PRECATORIUS*

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## ABSTRACT

A new pyridinium alkaloid, was isolated from the seeds of *Abrus precatorius* and identified Physicochemically with UV, NMR, IR and MS as nicotinic hydrazine which has been established as an antibacterial agent. This is the first report of the presence of this compound in *A. precatorius* seeds.

**Keywords:** alkaloid, UV, NMR, IR.

## INTRODUCTION

The seeds extract of *A. precatorius* have been used in Hindu medicine from early times, as well as in China and other ancient cultures, in the treatment of Ulcer and skin diseases externally.[1-2] *Abrus precatorius* seeds has been scientifically investigated for antimicrobial activity, antidiarrhoeal activity, uterotonic activity, and antifertility effects.[3-4]

Previously isolated classes of constituents from this seed include abrin, anthocyanins, N,N-dimethyltryptophan metho cation, precatorine, hypaphorine, choline, trigoneline, Steroids, flavonoids, toxins and agglutinins. [5-7] Though, many compounds have been isolated from the seeds, the alkaloids are not completely isolated. There is no report on the isolation of this type of alkaloid from the seeds of *abrus precatorius* so far.

## MATERIALS AND METHODS

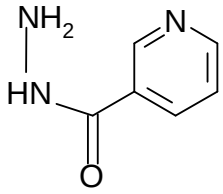
The *Abrus precatorius* L.Fabaceae(Leguminosae), seeds collected in November, (at Nsukka , Nigeria) was identified by a taxonomist Alfred Ozioko, Department of Botany, University of Nigeria, Nsukka, Nigeria. The voucher specimen deposited in the herbarium of the department of pharmacognosy Faculty of Pharmaceutical sciences University of Nigeria,

Nsukka. *Abrus precatorius* seeds were pulverised using a high-speed Creston machine. An aliquot (800 g) of the pulverised seeds were macerated in a mixture of 1600 ml of chloroform and 800 ml of methanol for 18 h, with two changes of the solvent and then filtered. The whatman no.4 filterate of the extract was mixed with 0.2 volume water to obtain two clear layers in a separating funnel. The upper aqueous methanol layer was drawn out and dried in a water bath. Eight grammes of the dried upper aqueous methanol layer was dissolved in 20 ml of methanol and poured on a column of Sephadex $LH_{20}$ swollen and packed in methanol. Elution was achieved with the same methanol as the solvent at a flow rate of 5 ml/min. Three-millilitre fractions were collected. Similar fractions were pooled to obtain $F_1$-$F_5$; these were monitored on thin layer chromatography. Fractions 4-10 ($F_2$) with characteristic brownish red colour was further purified using preparative thin layer chromatography. The gel filtered fraction was further separated using preparative TLC on silica gel $GF^{254}$, the solvent system methanol-chloroform-ammonia (8:1:1) gave six bands, which were scraped, dissolved and recovered with methanol. The portion with Rf =0.2 was further separated with another system n-Butanol-Water- Acetic acid (BAW) [65:22:13) on the same grade of silica gel. This resolved into three bands, the most pronounced band with Rf = 0.2 gave a characteristic violet colour under UV short wave light, with Dragendorff's spray reagent, it gave orange brown colouration, this portion was scraped, recovered in methanol-chloroform (1:1), and dried *in vacuo*.

## RESULTS AND DISCUSSION

The dry reside (yield=0.9 %) give rise to a new entity called 3-pyridinecarboxylic acid hydrazide or Nicotinic acid hydrazine also known as anyrole , Whitish amorphous granules, M.p. 161-162$^{o}$C; UV max (methanol 201-203 nm); $^{1}$H and $^{13}$C-NMR (300 and 500MHZ) respectively: $^{13}$C NMR (500MHz in MeOH) (δ Value) ppm 166.828(C=O), 147.535(C-6), 145.932(C-4), 147.143(C-2), 139.466(C-3) and 128.595(C-5); $^{1}$H NMR (MeOH, 300 MHz) δ 9.2 (s, Ar-H), 8.9 (1H, dd, Ar-H), 8.1(s, 1H), 7.4 (2H, br, $NH_2$ ); IR bands ( nujol) 3744.84, 3684.66, 2962, 2360, 1733.79, 1716.75 1699, 1684, 1653, 1399, 1259, 1024, 863 $cm^{-1}$ and some bands in the fingerprint region.

Elemental Analysis in %: C, 52.53; H, 5.14; N, 30.64; O, 11.67. $[M+H]^{+}$. $C_6H_7N_3O$ Calc.137.




**Isolated Compound (**nicotinic hydrazine)

This compound is known as an established antibacterial agent, the antimicrobial actions of nicotinic acids and its derivatives have been investigated. [8-9] The presence of Nicotinic acid hydrazine in *Abrus precatorius* is reported for the first time in this work and this therefore, validates both the folkloric claim and the compound responsible for the antimicrobial property *of A. precatorius* seed extracts against *staphylococcus aureus* and *Escherichia coli*. [1] Similar works in this direction has been reported.[10]

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