Phytochemical and Antisickling Studies of *Hymenocardia acida* Tul (Euphorbiaceae)

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Various phytochemical tests were carried out to determine the different chemical constituents of the stem bark and leaves of *Hymenocardia acida*. The sickling of washed human red blood cells effected by 2 % sodium metabisulphite was observed under the microscope before and after treatment with 0.5 %, 1.0 % and 2 % w/v water extracts of the stem bark and leaves. Phytochemical screening revealed the presence of carbohydrates, tannins, flavonoids, saponins, alkaloids, cardiac glycosides, resins, steroids and terpenes. The stem bark and leaves reversed the sickling of the red blood cells in a dose-dependent manner. Therefore, the use of the plant by traditional medical practitioners in the treatment of sickle cell anaemia may be justified.

Key words: *Hymenocardia acida,* phytochemical, antisickling studies.

INTRODUCTION

The plant *Hymenocardia acida* Tul (Euphorbiaceae family) is a shrub about 6 m in height, with twisted branches and an orange brown bark.

In northern Nigeria, the leaves and stem are used in the treatment of eye infection and sickle cell anaemia (oral communication).

The plant has been reported to have antibacterial and anti-yeast activity [1] as well as weak cytotoxic activity against certain cancers but no inhibitory activity against HIV [2].

In the search for alternatives to *Fagara zanthoxyloides* in the treatment of sickle cell anaemia [3], *Hymenocardia acida* is among the most promising, being commonly used for the management of this disease in Northern Nigeria. In this part of the country, *F. zanthoxyloides* is not common. There are few drugs, such as 2-hydroxymethylbenzoic acid, in orthodox medicine that act directly on the sickle cell to alleviate the condition. In most cases, haematinics, antibiotics, analgesics, water and/or blood infusion are used.

This paper reports on the chemical constituents and antisickling activity of the stem and leaves of *Hymenocardia acida*.

METHODOLOGY

The branches of *Hymenocardia acida* were collected from bushes of Dajin Tohu around Shika Dam, Zaria, Nigeria and were identified and allocated voucher specimen number 7108.

Phytochemical screening [4-6], extraction and fractionation [7] were carried out. The antisickling activity studies were carried out according to the methods of Fasanmade [8] and Sofowora [3].

RESULTS

The ethanolic extracts of the leaves and stem bark of *Hymenocardia acida* at concentrations of 0.5 %, 1.0 % and 2.0 % w/v reversed the sickling of red blood cells with 100 % reversal being obtained within 10 to 60 minutes. The activity was dose-dependent. The leaves are more commonly used compared to the stem. Therefore fractions of the leaves were further evaluated for antisickling effects.

All the fractions from the ethanolic extract of the leaves were active. Phytochemical screening revealed the presence of carbohydrates, tannins, saponins, flavonoids, cardiac glycosides, alkaloids, terpenes and steroids. The fractions containing saponins, flavonoids and carboxylic acid were found to reverse the sickling of red blood cells. Saponins and carboxylic acid have been reported to have antisickling activity [3, 9]. These results justify the use of the plant in the treatment of sickle cell anaemia.

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