Pharmacognostic profile of root of *Cryptolepis sanguinolenta* (lindl.) Schlechter

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ABSTRACT

Medicinal plants are traditionally found to be useful for many ailments. The present study highlights the pharmacognostical as well as phytochemical studies including parameters such as macroscopic, microscopic characters, physicochemical evaluation, chemomicroscopy and preliminary phytochemical studies of the root of *Cryptolepis sanguinolenta*. The morphological studies shows a root light to medium brown in color with hard and brittle texture, prisms of calcium oxalate crystals, sclereids and parenchyma cells. The transverse section showed parenchyma cells, vascular cambium, ray lines and phelloderm. Physico-chemical standards and their percentage values w/w were found to be: total ash (14.02 ± 0.12), acid insoluble ash (5.08 ± 0.18, %), water soluble ash (4.02 ± 0.27 %), sulphated ash (4.26 ± 0.11 %), alcohol soluble extractive (6.20 ± 0.45 %), water soluble extractive (28.40 ± 0.75 %) and moisture content (6.80 ± 0.25 %). Chemomicroscopical investigation revealed presence of lignin, tannin, oils, cellulose and calcium oxalate. Phytochemical analysis of the root revealed the presence of carbohydrates, alkaloids, glycosides, saponins, resins, proteins, steroids and terpenoids. These findings will help in identification, standardization of the root of *Cryptolepis sanguinolenta* (Lindl.) Schlechter and also distinguish it from its adulterants.

Keywords: *Cryptolepis sanguinolenta*, chemomicroscopic analysis, phytochemical analysis, physiccochemical standards.

INTRODUCTION

Herbal medicine is the oldest form of healthcare known to mankind. Throughout history, herbs had been used by all cultures as sources of medicine. Primitive man observed and appreciated the great diversity of plants available to him. The plants provided food, clothing, shelter and medicine. The use of plants as medicine is older than recorded history. Traditional and folklore medicine which was bequeathed from generation to generation is rich in domestic recipes and communal practice. About 1400 herbal preparations are widely used according to a recent survey in Member States of the European Union[1].

Cryptolepis sanguinolenta (Lindl.) Schlechter (Fam: Asclepiadaceae) the plant of interest is a shrub that grows in the rainforest and distributed throughout the West Coast of Africa. It is known as yellow dye root, *Akpaoku* (Igbo), *Gangamau* (Hausa), *Delboi* (Fulani).It is a twining, scrambling shrub, with characteristic thin stems and tuberous root stock. The leaves are opposite, thinly herbaceous, elliptic-oblong to ovate or lanceolate in shape up to 7 cm long and 3 cm wide. The margin is entire, the apex is curved and acuminate and the base is symmetrical and obtuse or rounded. The midrib projects prominently on the lower side and is pinnately nerved. The dried leaves have a slight bitter taste. It is used in hypertension, microbial infections, fever and stomach ache[2]. Clinical studies have shown that extract of the plant produced cures in patients with the concomitant elimination of parasitaemia in the blood[2]. The principal constituent of *Cryptolepis sanguinolenta* (Lindl) Schlechter is the indoloquinoline alkaloid, cryptolepine which occurs at a yield of 0.52 % in the roots, 0.48 % in the stem and 1.03 % in the leaves. The compound occurs with related bases and their derivatives. Cryptolepine has been found to produce antihyperglycemic and cytotoxic effects through GC-rich DNA sequence intercalation that provides basis for the design of new anticancer drug[3]. Another indolequinoline alkaloid quindoline synthesized from cryptolepine[4]. Dwuma –Badu *et al*[5] reported the isolation of quindoline from the

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roots of *Cryptolepis sanguinolenta*. Three new indole alkaloids hydroxycryptolepine, cryptoheptine and cryptoquindoline have been isolated and structurally elucidated as well[6]. Recently, a tetracyclic alkaloid, isocryptolepine has been isolated from the roots of *Cryptolepis sanguinolenta*[7]. Neocryptolepine and biscryptolepine (11-cryptolepin-11-y1)-cryptolepine), were isolated from the root bark of this plant and their structures elucidated[8, 9]. This study aims at establishing the macroscopic, microscopic, chemomicroscopic and physicochemical profiles of the root of *Cryptolepis sanguinolenta* that would be useful in preparing a monograph for identification of the plant.

MATERIALS AND METHODS

Collection of plant materials

The roots of *Cryptolepis sanguinolenta* were collected in February 2010 from Nsukka, Enugu State, Nigeria. It was identified and authenticated by Mr. A. Ozioko, a taxonomist with International Centre for Ethnomedicine and Drug Development (INTERCEDD) Nsukka, Enugu State and a Voucher Specimen (UN/PCOG/010/401) deposited in the Herbarium of Department of Pharmacognosy and Environmental Medicine, University of Nigeria, Nsukka.

Plant sample preparation

Fresh roots were collected, washed and excess water allowed to drain off. Representative samples were kept for examination while the rest were dried completely. They were pulverized and the powdered sample stored in airtight container for use in the microscopic, chemomicroscopic and phytochemical studies. Transverse sections were cut from the representative sample using sledge microtone. The sections were preserved in 70 % ethanol until needed for studies.

Macroscopical Examination

The macroscopical features of the fresh root were examined using the methods described by Evans[10].

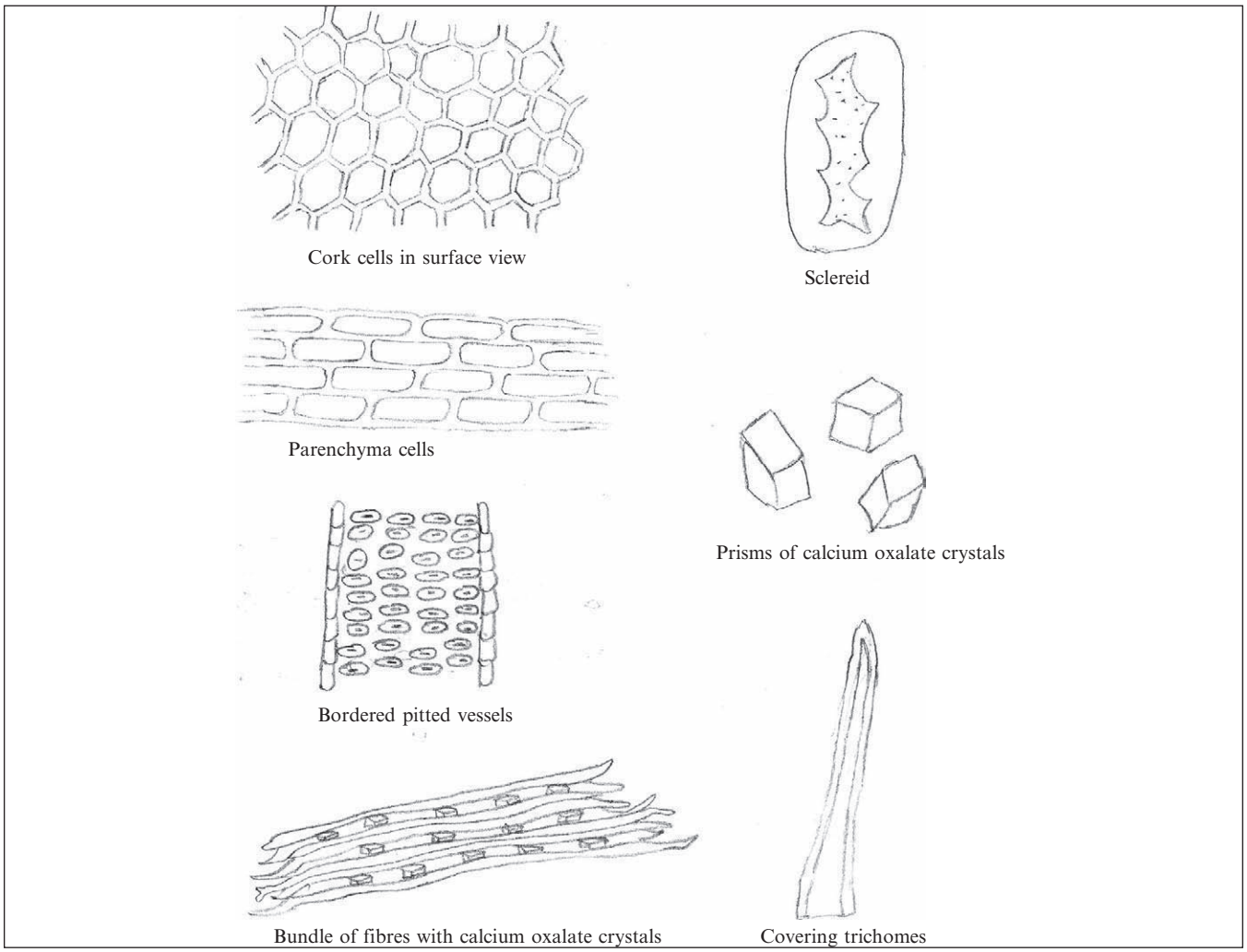

Figure 1: Microscopical features of root of *Cryptolepis sanquinolenta*