

Full Length Research Paper

# Identification and preliminary phytochemical analysis of herbs that can arrest threatened miscarriage in Orba and Nsukka towns of Enugu State

Akaneme, Florence Ifeoma

Department of Botany, University of Nigeria, Nsukka, Nigeria. E-mail: [omalichar@yahoo.com](mailto:omalichar@yahoo.com). Phone: +234-8036698201.

Accepted 03 November, 2020

Identification and preliminary phytochemical analysis of herbal plants that are used in arresting threatened miscarriage in Orba and Nsukka towns of Enugu State were investigated. The species identified include *Corchorus olitorius*, *Chrysophyllum albidum* synonym, *Gambeya albida*, *Carica papaya*, *Newbouldia laevis*, *Sida acuta*, *Ceiba pentandra*, *Ricinodendron heudelotti* and *Heliotropium indicum*. The preliminary phytochemical analysis detected the presence of carbohydrate, reducing sugar, alkaloids, glycoside, saponins, tannins, flavonoids, resin, proteins, oil, steroids, terpenoids and acidic compounds.

**Key words:** Identification, preliminary, phytochemical analysis, herbs, threatened miscarriage.

## INTRODUCTION

A miscarriage is the spontaneous loss of a foetus before 20 weeks gestation that is before it can survive outside the womb. Miscarriage can occur even before a woman is aware that she is pregnant and it has been estimated by Homeier (2005) that 1- 5% pregnancies end in mis-cariages. There are signs that reveal the probable occur-rence of a miscarriage. Pokipoki (2005) listed them to include vaginal bleeding that may start as a brownish discharge, cramps in the pelvic area (lower back or abdomen), pain in the lower back or abdomen and tissue or blood clots passing from the vagina. Several factors can dispose a pregnant woman to a miscarriage. Accord-ing to Pokipoki (2005) a miscarriage may be due to the presence of abnormal chromosomes in the foetus, abnor-mal structure of the uterus, incompetent cervix, infec-tions, hormonal imbalances, immune system disorders, diseases such as poorly controlled diabetes, underactive thyroid, german measles and imbalances in diet.

Miscarriage can be subdivided into threatened, inevitable, incomplete, complete, missed and habitual. Each has its own treatment procedure. The focus of this study was on threatened miscarriage and Gaufberg (2006) described it as "Vaginal bleeding of any degree during

early pregnancy, although such bleeding is very common. Approximately, a fourth of all pregnant women have some degree of vaginal bleeding during the first two trimesters. About half of these cases progress to an actual miscarriage. Bleeding and pain accompanying threatened abortion usually are not very intense. Threatened abortion rarely presents with severe vaginal bleeding. On vaginal examination, the cervical canal is closed and no cervical motion tenderness or tissue is found. Diffuse uterine tenderness and/or adnexal tender-ness may be present. Threatened abortion is defined by the absence of passing/passed tissue and the presence of a closed cervix. These findings differentiate threatened abortion from later stages of abortion".

The treatments prescribed by conventional doctors for this type of miscarriage are open to criticisms, since there are no empirical data to support them. The prescriptions include bed rest, avoidance of strenuous exercises and abstinence from sexual intercourse for some time (Pokipoki, 2005).

Many authors have reported on the renewed interest in the use of medicinal plants (Akubue, 1996; Hart and Schumake, 2004). The latter authors also reported that



**Figure 1.** *Corchorus olitorius*; Family: Tiliaceae.



**Figure 2.** *Chrysophyllum albidum* A. DC-Synonym: *Gambeya Albida*; Family: Sapotaceae. Common names: English: White star apple; Igbo: Udala or Udara; Yoruba: Osan.

the World Health Organization estimated that 80% of people worldwide rely on herbal medicines for some aspect of their primary healthcare. Akubue (1996) observed that the upsurge in the use of herbal remedies in developed countries is due to consumers' preference for products of natural origin. In developing countries on the other hand, he noted that inspite of the fact that some people regard phytomedicines as primitive medicine, they still rely on it for the treatment of many illnesses (minor or major) or when orthodox medicines fail to produce the desired results.

Asicumpon (2005) listed six medicinal plants of Nigeria as being very good for the treatment of threatened abortion. The plants are *Ageratum conyzoides* (Family Compositae), *Boerhavia diffusa* (Family Nyctaginaceae), *Combretum paniculatum* (Family Guttiferae), *Newbouldia laevis* (Family Bignoniaceae) and *Portulaca oleracea* (Family Portulacaceae). In this study, therefore, we report information on herbs that can arrest threatened miscarriage in Orba and Nsukka towns of Enugu State. Phytochemical analyses of identified herbal plants were also performed in order to search for bioactive agents. The results will add to the documentation of indigenous knowledge of herbal medicine in Nigeria and Enugu State in particular.

## MATERIALS AND METHOD

### Identification of herbs that can arrest threatened miscarriage

Oral interview method was used to obtain information on the availability of herbs that can arrest threatened miscarriage. Two herbal medical practitioners were interviewed; one in Nsukka town and another in Orba town, both in Enugu State. Information on the parts of the plants used, the method of preparation of the herbal drugs and dosages were also obtained.

### Sample collection

The plant parts used in treatment were obtained from Orba town on 16<sup>th</sup> July, 2006. The plant species from which the plant parts were derived from were confirmed and authenticated by Mr. A. O. Ozioko of Herbarium Section of Biodiversity and Conservation Programme/International Center for Ethnomedicine and Drug Development, located at No.110 Aku Road, Nsukka.

### Sample preparation

The plant parts were sun-dried and separately ground into powder. The powdered materials were subsequently stored in airtight bottles before analysis.





**Figure 6.** *Ricinodendron heudelottii*; Family: Euphorbiaceae; Common names: Igbo: Okwe.

failure to meet these needs leads to varying degrees of malnutrition or protein calorie malnutrition. Malnutrition, according to him, may have a negative effect on the time course of recovery as well as on mortality. The use of the young leaves of *C. papaya* has an added advantage due to the fact that the macerated leaves, in conjunction with Basil (*Ocimum*), is used in treating diabetes (Asicumpon, 2005) which is also one of the causes of miscarriage.

Natural oils are compounds of glycerol and fatty acids. Garrett and Grisham (1995) reported that one function of essential fatty acids is to serve as a precursor for the synthesis of eicosanoids, such as prostaglandins. The prostaglandin is a class of compounds whose effects are like those of hormones and they participate in many physiological processes. The traces of oil observed in some of the plants may be involved in these processes and ultimately play a part in correcting hormonal imbalance which is one of the causes of threatened miscarriage. The minute amount of these oils is not a disadvantage, since Roberts (1971) noted that a minute quantity of a hormone may exert a profound effect on an organism's physiological processes.

Alkaloids have analgesic, anti-spasmodic and bactericidal effects and this is the basis for their use as basic medicinal agents (Okwu, 2004). The alkaloids identified

in this study may function to control threatened miscarriage through these processes. Their analgesic properties may help to relieve pain in the lower back and abdomen; their antispasmodic properties may relieve cramps which may accompany bleeding from the uterus while their bactericidal effects may help to control infections. Infections may also be controlled by the presence of saponins which were identified in only two species in the present study. Oliver-Bever (1986) and Okwu (2004) had earlier reported that saponins have antibiotic properties and so help the body to fight infections and microbial invasion.

Okwu and Okwu (2004) reported that tannins have astringent properties, hasten the healing of wounds and inflamed mucous membranes. They concluded that these properties support the use of lemon juice in herbal medicine for the treatment of hemorrhoids (bleeding) among other disorders. This conclusion could be extrapolated to the use of the plant species identified in this study for the treatment of threatened miscarriage which is characterized by bleeding from the uterus.

According to Middleton and Kandaswami (1993), the flavonoids have long been recognized to possess anti-allergic, anti-inflammatory, antiviral, anti-proliferative and anti-carcinogenic activities as well as to affect some aspects of mammalian metabolism. Farwuar (1996) included protection against free radicals, platelet aggregation, microbes, ulcers and hepatotoxins. The phytochemical analysis revealed the presence of flavonoids in the herbal plants identified in this study with the exception of *R. heudelottii*. The anti-allergic function of flavonoids is particularly advantageous since it may help in the treatment of immune system disorders which are responsible 5 - 10% of recurrent miscarriages. Since flavonoids prevent platelet stickiness (platelet aggregation), they are probably wonderful remedies for the treatment of all types of miscarriages. Through this preventive function, flavonoids 'thin the blood' and thereby inhibit the clotting pathway. They may thus prevent miscarriage since one of the warning signs of a miscarriage is the presence of tissue with clot-like material passing from the vagina. There is a synergy here between the conventional and herbal treatment of miscarriages. Conventional treatment of particularly recurrent miscarriage involves the use of daily doses of aspirin or heparin to 'thin the blood' and thus inhibit the clotting pathway (Randine, 2003). Flavonoids may also help to arrest threatened miscarriage due to their biological function of protection against microbes.

Plant steroids are collectively known as phytosterols (Roberts, 1971). They are mainly restricted to the plant membrane and may function there as cholesterol does in animal membranes (Goodwin and Mercer, 1983). These authors further noted that evidences for this have been found in some plants where progesterone, deoxycorticosterone and androstanetriol were detected. Chiras

**Table 1.** Herbal plants, parts used, methods of preparation and dosages.

S/N	Family and Scientific name	Common names	Parts used	Method of preparation	Dosage
1.	Tiliaceae <i>Corchorus olitorius</i>		Leaves	Collect equal quantities of tender leaves of <i>C. olitorius</i> and <i>Carica papaya</i> . Cook to a boiling point. Allow to cool very well and then dispense.	One tumbler, 3 times daily.
2.	Sapotaceae <i>Chrysophyllum albidum</i> A. Dr Synonym: <i>Gambeya albida</i>	English: white star Apple. Igbo: Udara, Udala. Yoruba: Osan.	Leaves	Cook the leaves to a boiling point. Never open the pot till the time of administration	One tumbler, 3 times daily.
3.	Caricaceae <i>Carica papaya</i>	English: Pawpaw. Igbo: Okwuru – ezi, Okwuru-bekee, Mgbimbi. Hausa: Gwandu. Yoruba: Ibepe.	Tender leaves	Same as in (1) above	One tumbler 3 times daily.
4.	Bignoniaceae <i>Newbouldia laevis</i>	English: Fertility plant. Igbo: Ogilisi, Ogirisi. Hausa: Aduruku. Yoruba: Akoko.	Leaves and roots	Wash the roots in water just to remove soil. Cook to a boiling point. Then allow to cool very well.	One tumbler 3 times daily.
5.	Malvaceae <i>Sida acuta</i>	Igbo: Udo.	Whole leaves (aerial parts)	Cook the leaves to a boiling point. Allow to cool very well.	One tumbler 3 times daily.
6.	Bombacaceae <i>Ceiba pentandra</i>	English: Silk cotton tree, Kaboka tree. Igbo: Akpu – ogwu. Hausa: Rimi. Yoruba: Ogungun Araba.	Stem bark	Cook the stem bark to a boiling point. Allow to cool very well.	One tumbler 3 times daily.
7.	Euphorbiaceae <i>Ricinodendron heudelotti</i>	Igbo: Okwe.	Stem bark and roots	Wash the specimens lightly so as not to remove the essential ingredients. Cut into bits. Cook to a boiling point and allow to cool very well.	One full tumbler 3 times daily.
8.	Boraginaceae <i>Heliotropium indicum</i>	English: Indian Heliotrope, Turnsole, Cock's Comb. Hausa: Kalkaashin Korama. Yoruba: Agogo-igun.	Whole plant and clay	Collect a reasonable quantity of the whole plant. Grind them very well. Then mix with clay in an ointment form.	Apply some quantity of the ointment around the waist of the patient.

(1999) had observed that cholesterol in humans is a raw material for the synthesis of other steroids such as vitamin D, bile salts and the sex hormones - oestrogen, testosterone and progesterone. Progesterone, according

to the author, plays a role in the menstrual cycle and also helps to maintain pregnancy. Sterols identified in this study may perhaps be involved in the synthesis of progesterone. Figures 1 – 6 show the habit photographs of

**Table 2.** Phytochemicals detected in the identified plants.

Phytochemical	<i>Corchorus olitorius</i>	<i>Chrysophyllum albidum</i>	<i>Carica papaya</i>	<i>Newbouldia laevis</i>	<i>Sida acuta</i>	<i>Ceiba pentandra</i>	<i>Ricinodendron heudelotti</i>
Carbohydrate	++	+++	++	++	-	-	-
Reducing sugar	+	+++	++	+	-	+	-
Alkaloids	-	+++	++	+	+++	+	-
Glycoside	-	-	++	-	+	-	-
Saponins	-	-	++	-	+	-	-
Tannins	++	+++	+++	++	+	+	-
Flavonoids	++	++	++	++	++	+	-
Resin	-	+	+	+	-	+	+
Proteins	+++	+++	+++	++	+++	+	+
Oil	+	+	-	+	-	-	+
Steroids	+	-	-	+	+	+	-
Terpenoids	+	++	+	++	+	++	++
Acidic compound	-	-	+	+	-	-	-

+ = Present; ++ = strongly present; +++ = very strongly present; and - = absent.

some of the identified plants.

The present study has authenticated the usefulness of the identified plants for medicinal purposes. These species could also be seen as potential sources of useful drugs due to their rich contents of phytochemicals.

## ACKNOWLEDGEMENTS

The author wishes to acknowledge the National Biotechnology Development Agency (NABDA) and the United Nations University, Tokyo, Japan – Institute for Natural Resources in Africa (UNU – INRA) for organizing the training workshop under which this project was carried out. The training was on plant taxonomy, systematics and indigenous bioresources management.

## REFERENCES

- Akubue PI (1996). Regulatory Requirements for Production and Marketing of Phytomedicines. Paper presented at the International Workshop on Commercial production of Indigenous plants as phytomedicines and cosmetics. Bioresources Development and Conservation Programme (BDCP), Lagos, Nigeria.
- ASICUMPON (2005). Checklist of Medicinal Plants of Nigeria and their uses. ASICUMPON, Enugu, p. 135.
- Berdanier CD (1995). Advanced Nutrition: Macronutrients. CRC Press, Boca Raton, p. 277.
- Chiras DD (1999). Human Biology: Health, Homeostasis and the Environment. Jones and Bartlett Publishers, Massachusetts, p. 608.
- Farquer JN (1996). Plant Sterols: Their Biological Effects in Humans. In: Okwu DE, Emenike IN (2006) Evaluation of the phytonutrients and Vitamin content of citrus fruits. Int. J. Mol. Med. Adv. Sci. 2(1): 1-6.
- Garrett RH, Grisham CM (1995). Biochemistry. Saunders College Publishing, Fort Worth, p. 1100.
- Gaufberg SV (2006). Abortion Threatened. www.emedicine.Com.

- Goodwin TW, Mercer EI (1983). Introduction to Plant Biochemistry. Pergamon Press PLC. Oxford, p. 677.
- Harbourne JBC (1973). Phytochemical Methods, Chapman and Hall, London.
- Hart JA, Schumake RL (2004). Herbal Medicine, www.umm.edu/altmed.
- Homeier BP (2005). Miscarriages. kidshealth.org/parent/medical/sexual/miscarriage.html.
- Middleton E, Kandaswami C (1993). The Impact of plant flavonoids on Mammalian biology: implications for immunity, inflammation and Cancer. In: Harbone JB (ed.) The Flavonoids: Advances in Research Since 1986. Chapman and Hall, London.
- Okwu DE (2004). Phytochemicals and vitamin content of indigenous spices of South – Eastern Nigeria. J. Sustain. Agric. Environ. 6: 30-34.
- Okwu DE, Okwu ME (2004). Chemical compositions of *Spondias mombin* linn. Plant parts. J. Sustain. Agric. Environ. 6: 140-147.
- Oliver-Bever B (1986). Medicinal plants in Tropical West Africa. In: Okwu DE, Emenike IN, Evaluation of the phytonutrients and vitamin content of Citrus fruits. Int. J. Mol. Med. Adv. Sci. 2 (1): 1-6.
- PokiPoki A (2005). Miscarriage. www.ajasepokipoki.com
- Randine RL (2003). Immunologic, Autoimmune Factors and Recurrent Miscarriages www. easternharmonyclinic.com.
- Roberts MBV (1971). Biology – A Functional Approach. Thomas Nelson and Sons Surrey, p. 655.
- Trease GE, Evans WC (1989). Textbook of Pharmacognosy. 14th ed. W.B. Sanders, London.