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ETHNO-MEDICO ANALYSIS OF RARE PLANTS USED BY TRIBAL OF ODISHA, INDIA AS REMEDY AGAINST THREATENED MISCARRIAGE

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ABSTRACT
A phytochemical analysis of herbal plants used as a remedy against threatened miscarriage was made in the tribal dominated village panchayat of Bolangir, Orissa dominated the area of study where five species were identified such as *Corchorus olitorius*, *Carica papaya*, *Sida acuta*, *Ceiba pentandra* and *Heliotropium indicum*. The alkaloid, saponins, resins, flavonoids content of these plants mainly control the miscarriage without any side effects as they are of natural products. So the proper conservation of such precious medicinal plants is required for future use as these are in a verge of extinction due to various environmental constraints.
Keywords: Bolangir; herbs; phytochemical analysis; threatened miscarriage.

INTRODUCTION
A miscarriage is the spontaneous loss of a foetus before twenty weeks gestation i.e. 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 that 1-5% pregnancies end in miscarriage (Homier, 2005). There are signs that reveal the probable occurance of miscarriage which includes vaginal bleeding that may start as brownish discharge, cramps in the pelvic area, pain in the lower back and tissue or blood clots passing from the vagina. Miscarriage can be subdivided into threatened, inevitable, incomplete, complete, missed and habitual (Ifeoma, 2007). The focus of this study is on threatened miscarriage. A threatened miscarriage is characterized by the absence of passing/passed tissue and the presence of a closed cervix. The treatments prescribed by conventional doctors for this type of miscarriage are open to criticism, since there are no empirical data to support them. The prescription includes bed rest, avoidance of strenuous exercises and abstinence from sexual intercourse for sometime (Pokipoki, 2005). In this study we, therefore provide information on the herbs used by the tribal people for arresting threatened miscarriage as per the advice of village medicine man or kabiraj of panchayat called Bhutiyarbahal and chikalbahal of Bolangir, one of the backward districts of Orissa. Phytochemical analyses of identified herbal plants were also performed in order to search for bioactive agents. The World Health Organization estimated that about 80% of people worldwide rely on herbal medicines for some aspect of their primary healthcare, especially the tribal people as they have to travel a long distance to have their treatment in the Government hospital and also due to easy availability of the medicinal plants in the nearby forest on which they completely depends for their food to healthcare (Mohapatra and Sahoo, 2008). In this paper an attempt has been

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made to analyze the various herbal plants used by the tribal people of Bolangir (Orissa) as a remedy against the miscarriage.

Study Area

The district of Bolangir (Orissa) is flanked in the North West by Gandhamardhan hills, a name of Ramayan fame (Fig-1). The district is situated in the valley of rivers like Ang and Tel. It is in the western highlands of Orissa state with an average rain fall of about 1230 cm and red sandy to red loamy soil nature. Out of 6 million tribal people about 62 notified tribe are seen in Orissa (Mohapatra, 1993). The threevillages i.e. Chikalbahal, Kudasingha and Bhutiyarbahal are dominated by tribal like Kondha, Sabar, Gond, Mahar etc. Bolangir is one of the drought affected district of Orissa due to less rainfall. The three study villages are about 30 Km. away from the Bolangir town. The villagers mainly depend on the forest available near village Chikalbahal for their lively hood.

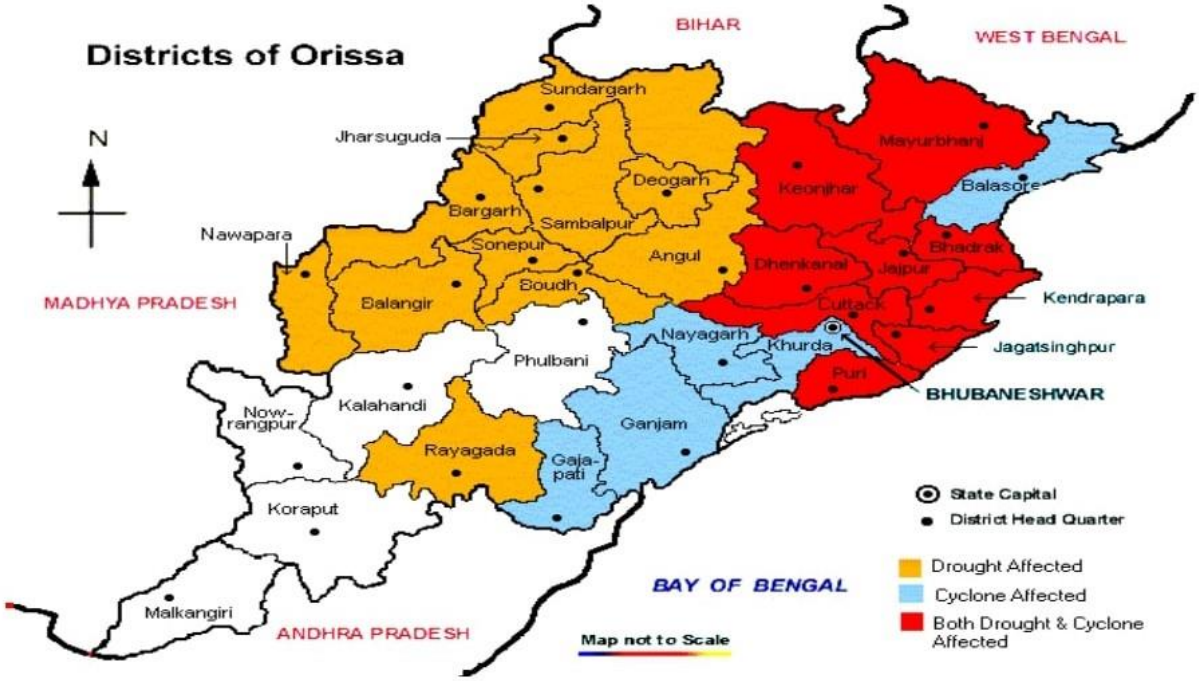


Fig-1 Map of Orissa showing Bolangir as draught affected district bordering Madhya Pradesh state

METHODOLOGY

Identification and sample collection of herbs that can arrest threatened miscarriage An oral interview method was used to obtain information on the availability of herbs that can be used against threatened miscarriage. Two herbal medical practitioners were interviewed and were requested for spot verification to get additional information on the method of preparation of the said drug. In addition to this the women of sabar tribe of Chikalbahal village (Fig-7) were also interviewed about the disease.

Sample preparation

The plant parts were sun-dried and separately ground into powder and the powdered materials were stored in airtight

bottles before analysis. Preliminary phytochemical analysis The chemical tests were carried out on the powdered materials, using the procedures outlined by Harbourne (1973), Trease and Evans (1989).

Standrdization of samples

By following the basic manual of Trease and Evans pharmacognosy the standardization of samples were done by chromatography techniques (TLC). The basic phytochemicals like carbohydrate, proteins and oil are estimated by simple biocehemical procedure.

RESULTS AND DISCUSSION

The herbal plants identified, the parts used, the method of preparation of the herbal drugs and dosages are shown in Table 1. The commonest parts of the plants that are used are leaves and the dosages are all the same and the decoctions are administered orally with the exception of H. indicum. The different phytochemicals found are shown in Table 2. Generally, it could be observed that Carica papaya had more phytochemicals than the others. The species with least phytochemicals was ceiba pentandra (Graph). The presence of terpenoids and proteins was detected in all the plant species. Glycosides and saponins were detected in *Carica papaya* and *Sida acuta* only while acidic compounds were found only in *Carica papaya.* The presence of proteins and carbohydrates in most of the herbal plants may be a factor in arresting threatened miscarriage which is specifically due to malnutrition or infection. In other words, the herbal plants may supply the needed micronutrients or their precursors.

Table-1 Herbal Plants, Parts used, Methods of preparation and Dosage

Sl No.	Family name & Scientific name	Common name	Parts used	Methods of preparation	Dosage
1	Tiliaceae *Corchorus olitorius* L.	English- Jew's Mallow Odia- Jhota	Leaves	Collect equal quantities of tender leaves of C.olitorius and Carica papaya. Cook to a boiling point. Allowed to cool very well and then dispense	1 glass three times daily in empty stomach
2	Caricaceae *Carica papaya* L.	English- Papaya Odia- Amrut bhanda	Tender Leaves	Same as (1) above	Same as(1) above
3	Malvaceae *Sida acuta* Burm. F	Odia- Bajramuli	Whole leaves	Cook to boiling point and allowed to cool well very well	Same as(1) above
4	Bombaceae Ceiba pentandra L.	English- white silk cotton	Stem bark	Cook to boiling point and allowed to	Same as(1) above

		Odia- Sweta simuli		cool well very well	
5	Boraginaceae *Heliotropium indicum* L.	Odia- Hatisundha	Whole plant & clay	Collect a reasonable amount of whole plant and grind them well. Mix with clay like an ointment form	Apply some quantity of the ointment form on the waist of the patient 2 to 3 times

(The dosage as described by the village medicine-man or Vaidya)

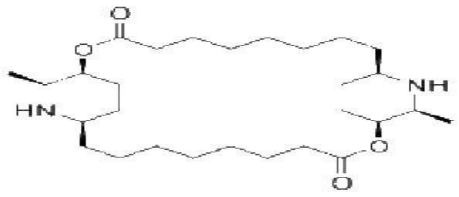
Table-2 Photochemical detected in the identified plants

Phytochemical	*Corchorus olitorius* L.	*Carica papaya* L	*Sida acuta* Burm. F	*Ceiba pentandra* L.
Carbohydrate	++	++	-	-
Reducing sugar	+	++	-	+
Alkaloids	-	++	+++	+
Glycosides	-	++	+	-
Saponins	-	++	+	-
Tannins	++	+++	+	+
Flavonoids	++	++	++	+
Resins	-	+	-	+
Proteins	+++	+++	+++	+
Oil	+	-	-	-
Steroids	+	-	+	+
Terpenoids	+	+	+	++
Acidic compound	-	+	-	-

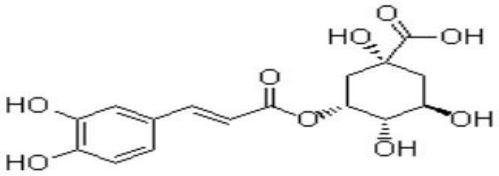
+(Present), ++(Strongly present), +++(Very strongly present), -(Absent)

Graph showing % of phytochemical content of identified plant species

Natural oils are compounds of glycerol and fatty acids. 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 (Garret and Grisham, 1995). The traces of oil observed in some of the plants may be involved in these processes and ultimately play a part in correcting hormonal imbalances which is one of the causes of threatened miscarriage. Alkaloids have analgesic, anti spasmodic and bactericidal effects and this is the basis for their use as basic medicinal agents. 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 are identified in only two species in the present study. Oliver-Bever, 1986 had earlier reported that saponins have antibiotic properties and so help the body to fight infections and microbial invasion. Tannins have also astringent properties, which hasten the healing of wounds and inflamed mucous membranes. These properties support the use of lemon juice in herbal medicine for the treatment of hemorrhoids among other disorders. This conclusion could be extrapolated to the use of plant species identified in this study for the treatment of threatened miscarriage which is characterized by bleeding from uterus.



Structure of Carpaine from *Carica papaya*



Structure of 5- Caffeoylquinicacid from *Corchorus olitorius*

The above two structure are Carpaine an alkaloid derived from the plant Carica papaya and 5-Caffeoylquinicacid (Neochlorogenicacid) is a phenolic compound derived from the leaves of Corchorus olitorius plant which has some antioxidant property. The flavonoids have long been recognized to posses anti allergic, anti-inflammatory, antiviral, anti-proliferative and anti-carcinogenic activities as well as to affect some aspect of mammalian

metabolism. The phytochemical analysis revealed the presence of flavonoids in all the herbal plants identified in the study. The anti-allergic function of flavonoids is particularly advantageous since it may help in the treatment of immune system disorders which are responsible for 5-10% of recurrent miscarriages. Since flavonoids prevent platelet stickiness they are probably wonderful remedies for the treatment of all types of miscarriages. There is a synergy between the conventional and herbal treatment of miscarriage. Conventional treatment of recurrent miscarriage involves the use of daily doses of aspirin or heparin to 'thin the blood' and thus inhabit 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). Chiras (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 plays a role in the menstrual cycle and also helps to maintain pregnancy. Sterols identified in this study may perhaps involve in the synthesis of progesterone. Figures 2-6 show the habit photographs of identified plants.

Fig-2 *Carica papaya*, Family- Caricaceae

Fig-3 *Sida acuta*, Family- Malvaceae

Fig-4 *Corchorus olitorius*, Family- Tiliaceae

Fig-5 *Ceiba pentandra*, Family- Bombaceae

Fig-6 *Heliotropium indicum*, family- Boraginaceae

Fig-7 Author S.P.Mohapatra with the women of sabar tribe of Chikalbahal village

CONCLUSION

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. The results that we get here will definitely add to the documentation of indigenous knowledge of herbal medicine. These results are experimentally established and were found suitable as per the description made by the local village medicine-man/vaidya who heals such type of diseases by their indigenous knowledge. Eventhough they don't have sufficient knowledge of pharmacognosy but they are practically sound and have enough knowledge about the plants and their parts which can be holistically used to cure certain diseases, which can't be cured by allopathic or homeopathic or any alternative phrma practices. So it is a challenge for us to preserve such rich knowledge and indigenous practices through proper documentation and if possible by herbarium.

The above study is just the preliminary study about the plants as there are many other plants available in our ecosystem which are till now underexplored.

Acknowledgements

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