

AYURVEDIC HERBS AND HERBOMETTALIC COMPOUNDS: ABORTIFICANT AND/OR TERATOGENIC POTENTIAL

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ABSTRACT

Ayurvedic herbs and herbo-metalic compounds are considered to be less toxic and possess fewer side effects from an extended period of time all over the world. *Ayurvedic* medicines are used all over the world in the treatment of various types of diseases. Metallic *Bhasmas* are highly valued and have their own importance in *Ayurvedic* formulations. To testify the *Bhasmas* various parameters have been told in *Rasashastra* classics. They are also taken as supplements by the pregnant ladies. *Ayurveda* say that the medication should be given with the knowledge of patient's age, strength, weight, sex and time. But some herbs and metallic compounds cause the toxicity to the developing fetus i.e. teratogenicity, so, a proper knowledge should be about teratogenicity of the *ayurvedic* preparations. Today in the modern era, self medication trend is running all over the world. The major causes of teritogenicity/ abortion/miscarriage are; Easy availability of the herbs, prepared *Ayurvedic* medicines, and accidentally intake or without medical supervision intake of a drug. Various types of ancient *ayurvedic* texts are described about the plants and herbomettalic compounds, which are not safe during pregnancy of their abortificant and/or teratogenic potential. The aim of this study was to present the implications of the use of herbs during pregnancy, pointing out those that should be avoided or prescribed under medical supervision only during this condition.

Keywords: *Ayurvedic* herbs, herbomettalic, pregnancy, teratogenic; *Bhasmas*

INTRODUCTION

Drugs that can cause birth defects are said to be 'teratogenic drugs'. Medical science cannot always predict how exposure to a teratogenic drug will affect a developing fetus. It can be dangerous for a pregnant woman to stop taking prescription drugs if she has a medical condition or becomes ill. According to estimates by the World Health Organization

(WHO), 80% of the world's population uses the resources of popular medicines to meet the needs of primary health care, which can circulate about 22 billion dollars annually (Costa *et al.*, 1998; Yunes *et al.*, 2001). Without treatment, the health and welfare of both the mother and her unborn baby could be at risk. The plants or their toxins are capable of causing

fetal death or abnormalities are referred to as teratogens. To be a teratogen, a plant toxin must readily cross the placenta at a high enough dose and be present at a specific time in gestation to exert its effect on the developing fetus. Birth defects are known to occur in 3-5% of all newborns. There are six main identified teratogenic mechanisms associated with medication use: foliate antagonism, neural crest cell disruption, endocrine disruption, oxidative stress, vascular disruption and specific receptor- or enzyme-mediated teratogenesis.^[1] Modern industrialization has introduced harmful metals into our environment, and there has been a good deal of speculation that heavy metals can cause teratogenesis. In fact many metals have been confirmed to have embryo toxicity in experimental animals, but only a few elements (e.g., mercury, lead, etc.) are known to be human teratogens. Teratogenicity of many metal compounds such as aluminum, cadmium, chromium, indium, nickel, platinum, tellurium, thallium, ytterbium and zinc salts has been confirmed in experimental animals. Some metalloids (e.g., arsenic, selenium and lithium) appear to have teratogenic potential for humans.^[2]

Risk Factors For Birth Defects

Medical science cannot always predict how exposure to a teratogenic drug will affect a fetus. Moderately lipid soluble drugs can easily diffuse across the placental membrane. Drugs with low molecular weight (<500 g/mol) diffuse freely across the placenta. Drugs with a higher molecular weight (between 500-1000 g/mol) cross the placenta less easily, while a few drugs with a high molecular weight (>1000 g/mol) do not cross the placental membrane. Transplacental transfer of drugs increases in the

third trimester due to increased maternal and placental blood flow, decreased thickness and increased surface area of the placenta.^[3]

The potential for harm depends on a range of factors including:

- The type of drug
- the size of the dose
- how often it's taken
- the stage of fetal development (gestational age) at the time of drug exposure
- the individual response of the fetus to the drug
- Other factors, such as maternal diet or illness.^[4]

Pregnancy Risk Classification For Ayurvedic Medicines

The classifications may be including:

A – Drugs that have been taken by a large number of pregnant women without any proven increase risk of birth defect. Ex. *zingiber, guggulu, jayanti, pippali, hingu, pudina* etc.

B – Drugs that have been taken by only a limited number of pregnant women. Human data is lacking and they are further categorized based on available data from animal studies. Ex. *Vilayati afsantin, Chui mui, Babuni ke phool, chirbilwa, bhurjapatra, chavya, holy basil, tamra bhasma, vang bhasma* etc.

C – Drugs that, due to their effects, may cause harm to the fetus without causing birth defects. These effects may be reversible. Ex. *ergot, Indian birthwort, Purging croton, gambose, Aloe vera, bhanga, popy, castor, papaya* etc.

X – Drugs that have a high risk of birth defects and should not be used during pregnancy. Ex. *bhasmas like Kaasis bhasma, Naag/Lead bhasma, Parad/Mercury bhasma, Tamra bhasma, Kansya bhasma, Manh-shila, hartal* (arsenic compound) etc.

Table 1: List of pregnancy risk/abortive herbs^{[5],[6],[7]}

DRUG	ENGLISH NAME	HINDI/LOCAL NAME	BOTANICAL NAME	FAMILY	PART USED	HERBOMINERAL DRUGS
AADRAK	<i>Zingiber</i>	<i>Shunthi, Naagar</i>	<i>Zingiber officinale</i>	<i>Zingiberaceae</i>	<i>Bulb</i>	<i>Soubhagya Shuthi Paak Shunthi Panak Rasnadi Kwath Samsharkar Churna Panchsum Churna</i>

						<i>Aadrak Khand</i>
<i>AHIPHENA</i>	<i>Popy</i>	<i>Afeem</i>	<i>Papaver somniferum</i>	<i>Papaveraceae</i>	<i>Latex</i>	<i>Ahiphenasav, Nidrodya Vati, Karpoor Rasa, Dugdha Vati, Maha Vaat Raj Rasa, Kamini Vidravan Rasa, Akarkarbhadi Vati, Trivanga Bhasma, Pradarari Rasa, Pradarantak Rasa</i>
<i>ANNAMYA</i>	<i>Ergot</i>	<i>Ergot</i>	<i>Claviceps purpurea</i>	<i>Clavicipitaceae</i>	<i>Fungus</i>	<i>Ergot Vati*</i>
<i>ANNANAS</i>	<i>Pine-Apple</i>	<i>Pine-Apple</i>	<i>Ananas comosus</i>	<i>Bromeliaceae</i>	<i>Juice</i>	<i>Juice 100 Ml Above</i>
<i>ARISHATAKA</i>	<i>Soup Nut Tree</i>	<i>Reetha</i>	<i>Sapindus trifoliatus</i>	<i>Sapindus</i>	<i>Seed</i>	<i>Asnadu Kashayam</i>
<i>ARKA</i>	<i>-Na-</i>	<i>Aakada</i>	<i>Calotropis procera</i>	<i>Asclepiadaceae</i>	<i>Latex</i>	<i>Arklavan, Arkatail, Arkeshwar Rasa, Asnadi Kashayam</i>
<i>BABUNA[6]</i>	<i>Bitter chamomile</i>	<i>Babuni Ke Phool</i>	<i>Matricaria chamomilla</i>	<i>Asteraceae</i>	<i>Flower Extract</i>	<i>Extract</i>
<i>BHANGAA</i>	<i>Marijuana/Indian Hemp</i>	<i>Bhang</i>	<i>Cannabis sativa</i>	<i>Cannabinaceae</i>	<i>Leaves, Pushpa Majari, Latex</i>	<i>Jatiphaladi Churna, Madnand Modak, Pushpadhanwa Rasa, Bhumutrantak Rasa, Maha Jawarankush Rasa</i>
<i>BHURJAPATARA</i>	<i>Jacquemon Tree</i>	<i>Charmi, Lekhyapatrak</i>	<i>Betula utilis</i>	<i>Betulaceae</i>	<i>Leaves</i>	<i>Yaskriti, Asnadi Kawath, Dhoopan</i>
<i>CHAVYA</i>	<i>Java Long Pepper</i>	<i>Chavika</i>	<i>Piper chaba</i>	<i>Piperaceae</i>	<i>Fruit And Leaves</i>	<i>Panchkol Phant, Praanda Gutika, Kankayan Modak, Chavyadi Ghrith</i>
<i>CHIRBILWA</i>	<i>-Na-</i>	<i>Karanjii, Churel</i>	<i>Holoptelea integrifolia</i>	<i>Ulmaceae</i>	<i>Twak</i>	<i>Piyush Valli Rasa, Indukanth Kashay, Gorochanadi Gutika, Raasnadi Churna, Laxinol Capsule</i>
<i>CHITRAKA</i>	<i>Leadwort</i>	<i>Agni</i>	<i>Plumbago zeylanica</i>	<i>Plumbaginaceae</i>	<i>Root</i>	<i>Chitrakadi Gutika, Chitraka Haritai, Kalian Gud, Vardhmaan Pippli Rasyana</i>
<i>DAADIM</i>	<i>Pomegranate</i>	<i>Anaar</i>	<i>Punica granatum</i>	<i>Lythraceae</i>	<i>Root</i>	<i>Dadim-chatuhsam, Dadimashtak, Mritsanjivani Sura, Lavan Bhaskar Churna, Narayan Churna Anupaan</i>
<i>DANTI</i>	<i>-Na-</i>	<i>-Na-</i>	<i>Baliospermum montanum</i>	<i>Euphorbiaceae</i>	<i>Root</i>	<i>Punarnavadi Guggulu, Dantyarishtha, Baahushal Guda, Shiv Gutika, dhanvantar ghrita</i>
<i>ELA</i>	<i>Lesser Cardamom</i>	<i>Elaichi</i>	<i>Elettaria cardamomum</i>	<i>Zingiberaceae</i>	<i>Fruit</i>	<i>Eladi Ghrith, Chaturajat Churna</i>
<i>ERAND</i>	<i>Castor</i>	<i>Redi Or Andi</i>	<i>Ricinus communis</i>	<i>Euphorbiaceae</i>	<i>Seed Oil</i>	<i>Castor Oil, Maharasnadi Kashaya, Chaturmukh Rasa, Errand Paka, Simhnaad Guggulu</i>
<i>ERANDAKARKATI</i>	<i>PAPAW Or Papaya</i>	<i>Papita</i>	<i>Carica papaya</i>	<i>Caricaceae</i>	<i>Fruit</i>	<i>Ashmari Har Kashaya, Syp. Alopazyme, Caripill, Cap. Upl at</i>
<i>GUGGULU</i>	<i>Indian Bedellium</i>	<i>Guggulu</i>	<i>Commiphora mukul</i>	<i>Burseraceae</i>	<i>Gum</i>	<i>Triphala Guggulu, Kaanchnaar Guggulu, Amrita Guggulu</i>
<i>HARMAL</i>	<i>Syrian Rue</i>	<i>Harmal</i>	<i>Paganum harmala</i>	<i>Zygophyllaceae</i>	<i>Seed</i>	<i>Powder*</i>
<i>HINGU</i>	<i>Asafoetida</i>	<i>Hing</i>	<i>Ferula nartex</i>	<i>Umbelliferae</i>	<i>Gum</i>	<i>Hingwashtak Churna, Hingwadi Wati, Hing Karpoor Vatiak, Rajah Pravartani Vati, Kankayan Vati</i>
<i>IND-HANA/DAMANAK</i>	<i>Wormwood</i>	<i>Vilayati Afsantin</i>	<i>Artemisia absinthium L.</i>	<i>Asteraceae</i>	<i>Panchang</i>	<i>Srigopala Taila</i>
<i>INDRAVARUNI</i>	<i>Bitter Apple</i>	<i>Indrayan</i>	<i>Cirullus colocynthis</i>	<i>Cucurbitaceae</i>	<i>Fruit/Root</i>	<i>Powder*</i>

			<i>Schrad</i>			
ISHWARI	Indian Birthwort	Naakuli	<i>Aristolochia indica</i>	Aris-tolochiaceae	Mool Patra	Root Poder,Leaf Juice
JAYANTI	-Na-	Jait	<i>Sesbania sesban Merril</i>	Legumino-sae	Flower And Seeds	Ratnaprabha Gutika,
JAYPAL/DRAVANTI	Purging Croton	Jamalghota	<i>Croton tiglium</i>	Euphor-biaceae	Seeds	Pushkar Leha,Jaymangal Rasa,Ichhabhedhi Rasa
KANKUSHTHA	Gambose	Tamal	<i>Garcinia morella</i>	Guttifereae	Seed Latex	Latex Powder Or Extract
KANYA	Aloe Vera	Ghritkumari	<i>Aloe vera Tourn. Ex Linn.</i>	Liliaceae	Patra Alua,Alua	Kumariaasav,Mukta Panchamrit Ghrit,Tamra Bhsma*
KARVEER	Indian Olean-der	Kaner	<i>Nerium indicum</i>	Apocyna-ceae	Root Root Twak	Haymaaradi Oil, Maanikyasa Rasa
KATUKA		Kutaki	<i>Picrorhiza kurro</i>	Scrophu-lariaceae	Root	Aarogyavardhani Vati,Saarivadyasav,Mahatiktika Ghrita,Mhayograj Guggulu
KEBUKA	Costus	Kebu	<i>Costus speciosus</i>	Zingib-eraceae	Root/Juice/Bulb	Brihta Poornachandra Rasa
KRASHNABEEJ	Pharbitis Seeds	Kaala Daana	<i>Ipomea nil Linn.</i>	Convolvulaceae	Seeds	Powder
KUPILU	Nuxvomica	Kuchla	<i>Strychnos nuxvomica</i>	Loganiaceae	Seed	Agnitundi vati rasa,Shoolharana Yoga,Ekangveer Rasa,Vishtinduka Vati
KUSHTHA	Costus	Kooth	<i>Saussurea lappa</i>	Compositae	Mool	Choorna
LAANGALI	Malabar Glory Lily	Kalihari	<i>Gloriosa superba</i>	Liliaceae	Root,Stem,Bulb	Kaalkut Rasa,Brhit Marichyadi Tailam,*
LAJJALU	Touch Me Not Plant	Chui Mui	<i>Mimosa pudica Linn.</i>	Legumino-sae	Panchang	Kutaj Avleha,Samngadi Churna,Lakshadi Churna,Pilocure Tab.
MADANPHALA	Emetic Nut	Pindi	<i>Randia spinosa</i>	Rubiaceae	Fruit	Bala Taila,Irimedadi Tailam,
PIPPALI	Long Peeper	Peeper	<i>Piper longum</i>	Piperaceae	Fruit Root	Gud Pippali,Pippali Khanda,Pipplayasav,Trikatu,Panchkol,Sitopaladi Churna,Talishadi Churna
PENNYROYAL [7]	Or Squaw Mint	-NA-	<i>Mentha pulegium L.</i>	Lamiaceae	Leaves	Powder/Arka
PUDINA	Mint	Pudina	<i>Mentha piperita L.</i>	Lamiaceae	Patra	Oil,Pudin Hara,Kofsil Symp.
SANAAY	Indian Senna	Sanaypatra	<i>Senna alexandrina Mill.</i>	Fabaceae	Patra	Panchsakar Churna,Yashtyadi Churna
SITAAB	Garden Rue	Sitab	<i>Ruta graveolens</i>	Rutaceae	Pancgang/Patratra	Juice/Oil/Phant/Powder*
SNUHI	Common Milk Hedge	Sehunda	<i>Euphorbia nerifolia</i>	Euphor-biaceae	Latex	Vjra Khar,Ayskriti,Madhu Snuhi Rasayana,Jalodarari Rasa,Shankhdrav
SUNN	Sunn Hemp	Sunn	<i>Crotalaria juncea Linn.</i>	Legumino-sae	Patra Seed	Juice, Churna*
SWARNKHEERI	Mexican Poppy	Satyanashi	<i>Argemone mexicana</i>	Papav-eraceae	Seeds/Oil/Latex	Powder, Oil,Latex
TAM-BOOL/TAMRAPARNA	Tree Tobacco Plant	Tamaal	<i>Nicotiana tabacum Linn.</i>	Solanaceae	Patra	Shwashtaka Avleha,Shwas Gajankush Rasa,
TRIVRAT	Turpeth/Indian Jalapa	nishoth	<i>Operculina turpethum Linn.</i>	Convolvulaceae	Root Bark	Narayan churna
TULSI	Holy Basil	Tulasi	<i>Ocimum sanctum Linn.</i>	Labiatae	Patra	Vibwadi Gulika,Tribhuwan Kirti Rasa,Maanasmitra Vatakam,Mahajwarankush Rasa,Mukta Panvhamrit Rasa

ULATKAMBALA	Devil's Cotton	Ulatkambala	Abroma augusta	Sterculiaceae	Root	Juice*
VANSH	Thorny Bamboo	Baans	Bambusa arundinaceae Willd.	Graminae	Vanshlochan	Poogkhanda, Mahatarunarka Rasa, Drakshavleha, Sitopaladi Churna
VATSANABH	Monk'S Hood	Bachang, Meetha Vish, Meetha Teliya	Aconitum ferox	Malvaceae	Root	Tamra Parpati, Saanjivani Vati, Anand Bhairav Rasa, Kaphketu Rasa
YASHTIMADHU	Liquorice	Mulethi	Glycyrrhiza glabra	Fabaceae	Root	Kumkumadi Tailam

*classical references of abortificant

Herbomettalic Drugs

Formulations of *Ayurveda* consist of substances of herbal, mineral/metal and animal origin which are processed pharmaceutical to have therapeutic effects. This is attributing of processes of *Shodhan* (purification/potential), *Bhavana* (impregnation/levigation) and *Marana* (incineration/calcinations) of *Rasa Shastra* which acclimatize these toxic industrial matter to an effective remedies known as herbo metallic formulations (*Rasaoushadhies*) of *Ayurveda*. In recent past there is prevalence of some doubt on safety and efficacy of these medicines [8] because of not proper standardization and physical or chemical parameters. It is also a very big issue to avoid the use of *bhasma* in pregnancy time. Another reason to avoid herbo-mettalic compounds is the nature of pregnant women. A pregnant lady must be avoided a medicine which have the properties like *ushna* (hot potency), *tikshna* (pungent), *vyavayi*, *vi-*

kashi, *ruksha* and *lekhana*. Some metallic compounds have these properties like *Naag*, *Tamra*, *Kaasis*, *Kansya*, *Manhashila* etc. So, these medicines may be the cause of abortion or miscarriage and mutogenic side effects. According to *Aacharya Charaka* in *agrya dravya*, *tikshna aushadh* is contraindicated in pregnant lady [9]. To testify the *Bhasmas* various parameters have been told in *Rasashastra* classics. Physical properties like *Varitara* (floating of *Ayurvedic bhasma* on water), *Unnama* (ability of *bhasma* to float on water, even after a grain is also put over film formed by *bhasma* over water), *Rekhapurnatava* (particle must be inserted in furrows of *Ayurveda* is quivering with a novel excitement in its long finger of human hand to ensure particle size), *Slakshnatvam* history. Chemical parameters like *Nishchandratvam*, *Varna (color)*, *GataRasatvam*, *Apunarbhavata*, *Niruttha*. [8]

Table 2: Properties Of *Bhasma* (Ayurvedic Metallic Preparation) [10]

BHASMA	RASA	VEERYA	VIPAKA	KARMA	FORMULA	PREPARATIONS
Kasis Bhasma	Amla, Tikta, Kashaya	Ushna	Katu	Lekhana	FeSO ₄ .7H ₂ O	Sheetpitta Bhanjan Rasa, Rajahpravratni Vati, Kasisadi Tail/Ghrit, Plihaari Vati, Guduchyadi Churna
Naag Bhasma	Madhur Tikta	Ushna	Katu	Lekhana	Pb	Gulmakuthar Rasa, Yograj Guggulu Rasyana, Jwarharivati, Suchikabharn Ras
Parad Bhasma	Madhur, Amla, Lavan, Katu, Tikta, Kashaya	Ushna	Katu	Lekhana	Hg	Vaat Vidhwansan Rasa, Suchika Bharan Rasa, Jwarankush Rasa, Rasraj Rasa, Brahad Vaat Chintamani Rasa, Anand Bhairav Rasa, Navjvrariras
Kansya Bahsma	Kashay Tikta	Ushna	Katu	Lekhana	Cu + Sn	Vraddhibadhika Vati
Manh Shila	Kashaya	Ushna	Katu	Lekhana	AS ₂ S ₂	Vaat Vidhwansan Rasa, Meghnad Rasa
Hartal	Kashaya	Ushna	Katu	Lekhana	AS ₂ S ₃	Vaatgajankush Rasa, Taalkeshwar Rasa
Vang	Tikta	Ushna	Katu	Lekhana	SnO ₂	Chandraprabha Vati. Chopchinyadi Churna, Chandanasav, Trivang Bhasma, Yogendra Rasa, Swarna Vanga, Kasturibhervo Rasa (Madhyam),

						Vangeshwar Rasa
Tamra Bhasma	Kashaya,Tikta,Madhur,Amla	Ushna	Madhur Katu*	Lekhana	Cu ⁺	Aarogyavardhni Vati, Panchamrit Parpati, Trivikram Ras,Aanandbhervi Vatika, Vidhyadharo Rasa

*Bhavprakash & Ayurveda Prakash

Kaasis Bhasma (Ferrous Sulphate)

Several kinds of evidence indicate that elevated iron during the 3-8 week embryonic (organogenesis) period of human gestation may be teratogenic. (1) In the embryonic period, the natural maternal absorption of food iron is 30% below the estimated daily iron loss. (2) As compared with maternal serum, embryonic fetal coelomic fluid contains only one-fourth as much iron but nearly six times the quantity of the iron withholding protein, ferritin. (3) In the embryonic period, intraplacental oxygen pressure is 2-3 times lower than in the subsequent fetal growth period. (4) Iron is a strong inducer of emesis which peaks in the embryonic period. (5) In a murine gestation model, iron was neurotoxin at a sharp peak of 8-9 days. Thus it would be prudent, in human pregnancy, to delay any needed iron supplementation until the embryonic period has been completed.^[11]

Naag Bhasma (Lead)

Lead has been shown to pass through the human placenta readily, and the concentration in the umbilical cord blood is 80-90 % as high as that in the maternal blood. A large cohort study suggests that increased exposure to lead from the environment in the prenatal and early postnatal periods results in the deficit of mental development. Lead in the environment is postnatal toxic and prenatally teratogenic. High levels of paternal lead exposure (>40 µg/dl or >25 µg/dl for a period of years) appear to reduce fertility and to increase the risks of spontaneous abortion and reduced fetal growth (preterm delivery, low birth weight). Maternal blood lead levels of approximately 10 µg/dl have been linked to increased risks of pregnancy hypertension, spontaneous abortion, and reduced offspring neurobehavioral development. Somewhat higher maternal lead levels have been linked to reduced fetal growth. Some studies suggest a link between increased parental lead expo-

sure and congenital malformations, although considerable uncertainty remains regarding the specific malformations and the dose-response relationships.¹²

Parad Bhasma (Mercury)

Liquid metallic mercury is hardly absorbed from the gastrointestinal tract. Inorganic mercury is also poorly absorbed, i.e., around 2% of ingested mercuric chloride is absorbed. Uptake of inorganic mercury by the fetus is very low. An experiment using mice revealed that a significant proportion of mercury is blocked in the yolk sack. Among the organic mercury compounds, the most accumulated knowledge pertains to methyl mercury compounds. Methyl mercury is efficiently absorbed through the intestinal tract and skin. It crosses the human placenta with infantile blood levels in excess of the mother's blood, giving rise to a higher risk for the fetus. Pathological features of children's brains affected by prenatal methyl mercury exposure are the outcome of disturbances in the development of the brain; microcephaly, dilated lateral ventricles, as well as derangement in the fundamental structuring of gray matter as the result of abnormal neuronal migration. Degeneration of already formed nerve cells is involved in some cases. Mercury Used traditionally in the felting of hats, hence "mad hatters", a more recent example of mercury's toxicity was shown in Japan. Japan had industrial mercury poisoning of waterways by methyl mercury causing Minamata disease, which had substantial neurological effects similar to Hunter Russell syndrome. In addition to their direct toxic effects, the potential reduction in fetal growth and long-term effects should also be considered.^[12]

Manh Shila & Hartal (Arsenic Compounds)

Arsenic was used as a healing agent after Greek physicians such as Hippocrates and Galen popular-

ized its use. Arsenic compounds became available as solutions, tablets, pastes, and in injectable forms. Arsenic was the primary treatment for syphilis until World War II. Arsenic continues to be an essential constituent of many non-western traditional medicine products. Some Chinese traditional medications contain realgar (arsenic sulphide) and are available as pills, tablets, and other preparations. They are used for psoriasis, syphilis, asthma, rheumatism, hemorrhoids, cough and pruritus, and are also prescribed as a health tonic, an analgesic, anti-inflammatory agent, and as a treatment for some malignant tumours. In India, herbal medicines containing arsenic are used in some homoeopathic preparations and haematological malignancies. In Korea arsenic is prescribed in herbal medicine for hemorrhoids. Arspenamine (nearsphenamine), a light yellow compound containing 30% arsenic was used intravenously to treat syphilis, yaws, and some protozoan infections.^[13] Today's major problem with arsenic toxicity is not the acute but the chronic poisoning. Arsenic is cancerogenic, mutagenic and teratogenic Millions of people in Bangladesh and West Bengal have no other choice but to use drinking water from naturally As-containing aquifers, which leads to serious health problems in these regions. The World Health Organization described it as "the greatest mass poisoning in human history".^[14]

Alcohol Preparations:-

When pregnant lady drinks, alcohol passes from mother's blood through the placenta and to fetus. A baby's liver is one of the last organs to develop and doesn't mature until the later stages of pregnancy and cannot process alcohol. Too much exposure to alcohol can seriously affect their development. Drinking alcohol, especially in the first three months of pregnancy, increases the risk of miscarriage, premature birth and your baby having a low birth weight. Drinking heavily throughout pregnancy can cause your baby to develop a serious condition called foetal alcohol syndrome (FAS). Children with

FAS have: poor growth; facial abnormalities; learning and behavioral problems.^[15]

Asavas and *aristhas* (fermented preparation) possess self generated alcohol which acts as natural preservative obtained through conventional process. In *ayurvedic* system of medicine these formulations are in vogue since the time of *samhita* period. *Samhitas* present detailed description of the technology of manufacturing of *asava- arishta*. Due to palatability, accelerated therapeutic action and enhanced drug concentration, these formulations are superior over other *kalpanas*. The alcoholic content is limited to maximum of 11% as per the standardization. So must be avoided during pregnancy time.^[16]

CONCLUSION

Teratogens have negative effects on the developing human beings. The adverse effects can be at both prenatal and postnatal stages of human development. Pregnant women should be very careful with what they inject in the name of drugs both prescription and non-prescription drugs. This review helps the drug prescribers and others who used the plant based drugs on its traditional basis for the selection of non damaging drugs. This review will also be helpful for the selection of plants for the preparation of poly-herbal formulations which can be used safely during the pregnancy.

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