



## **ETHNOMEDICINES USED IN GYNECOLOGICAL AND OTHER RELATED PROBLEMS BY TRIBAL PEOPLES OF NORTH MAHARASHTRA, INDIA**

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### **ABSTRACT**

Ethnomedicinal plants survey was conducted in the remote hills, forests and rural areas of North Maharashtra. Diversified ethnic peoples, rich in state of India for gathering information of traditional method of gynecological problems. Semi-structured questionnaire was used during the interview with the informants having traditional ethnomedicinal knowledge. Use of medicinal plants were documented using an interview datasheet mentioning detailed information of the informants and vernacular names, parts used, method of preparation and mode of administration. Finally, collected samples of botanicals, prepared herbarium, identified and scientific names were confirmed by Department of Botany, Jijamata College, Nandurbar. A total of 133 ethnomedicinal plants belonging to 67 families have been documented having antifertility property, contraceptive and abortifacient. This paper represents detailed profile of each plant including scientific name, family, common name, parts used, activities, mode of preparation and dosage.

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### **INTRODUCTION**

Over growing population is one of the major threats in the developing countries, facing new challenges, with its inevitable consequences on all aspects of development (Ciganda C, Laborde A 2003). Therefore, there is an urgent need to control population explosion, and to ensure better health for one and all (M. B. Patil and P. A. Khan 2017a). Efforts have been taken to tackle this serious problem by developing antifertility agents called contraceptive; those chemical substances that inhibit either the sperm production or sperm motility in males or prevent the formation of ovum and produce some changes in the endometrium, making it unsusceptible to a fertile ovum in females (Kaunitz AM, Benrubi GI 1998).

Synthetic hormonal contraceptives cannot be used continuously because of their health related effects, like increase in blood transaminase and cholesterol levels, dyspepsia, headache, depression, tiredness, weight gain, hypermenorrhea and intermenorrhoeal hemorrhage and also disturb the metabolism of lipid, protein, carbohydrate, enzymes and vitamins (Noumi NYC, Tchakonang C 2001). Therefore, scientists are on the hunt for newer alternatives, with lesser side effects, self-administrable, less expensive and with complete reversibility.

Much of these properties are observed in drugs of natural plant origin. Many plants are reported to have fertility regulatory activity.

Plants having such properties may have role in rapid discharge of the fertilized ova from the fallopian tube, inhibition of implantation due to a interruption in estrogen- progesterone balance, foetal abortion due to lack supply of nutrients to the uterus and the embryo, and also on the male by affecting sperm count, motility, and viability. In recent years, many workers have reported a lot of traditional plants used for antifertility purpose (Mishra, 2009, Mukherjee S and Mitra S., 2009 and Yadav *et al.* 2006). Most of the tribal economies have been engaged in subsistence agriculture, piggery, fishery and hunting. With the passage of time, tribal communities have been developed a great deal of knowledge on the use of plants and plant products in curing various diseases, ailments (Maheswari *et al.*, 1986). In the present study, an attempt has been taken to investigate and document the herbal practices for antifertility purpose by the ethnic peoples of Tripura state.

### **MATERIALS AND METHODS**

Various localities will be visit periodically for collection and field observations of ethnobotanically important plants. Method necessary for a botanical collection as well as modern ethnobotanical work have been followed and adopted from the earlier workers like Jain, (1987a, 1988, 1989, 1995a); Jain and Rao, (1976,1977); Ragavaiah, (1956). During the visits ethnobotanically important plants will be collect in 3 sets.

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Table 1 Ethnomedicinal plants with their use and mode of preparation

Sr. No.	Plant name, Family	Common names , Part used	Activities	Mode of preparations and Dosage
1	<i>Abrus precatorius</i> L. Fabaceae	Gunj Seeds	Contraceptives	½ tea spoon paste of seeds orally given twice a day in empty stomach for 3days just after completion of menstrual period.
		Seed	Abortifacient	1 tea spoon of seeds paste orally given once in a day in empty stomach for 2 days for 2-3 months of pregnancy. Seeds without seed cot is kept overnight in milk and the seed paste is given on the last day of menstruation to prevent conception.
2	<i>Abutilon indicum</i> L. Malvaceae	White seed	Preventing conception	
		Sikka	Leucorrhoea	Root powder is taken for the treatment of leucorrhoea.
3	<i>Acacia arabica</i> Willd. Mimaceae	Kikar	Leucorrhoea	Paste made from 10 gm gum and two leaves of <i>Amaltas</i> is taken with cow milk. Powder of unripe fruit, flowers, and leaves mixed in equal quantity with sugar and water is taken to relieve from leucorrhoea
4	<i>Acacia catechu</i> (L.f.) Willd. Mimaceae	Katha	Abortifacient	Bark 3-5 ml. of bark juice is taken orally for the first three months.
5	<i>Acalypha indica</i> L. Euphorbiaceae	Kupi	Abortifacient	A cup of decoction whole plant is orally given on empty stomach for 3 days. (M. B. Patil and P. A. Khan 2015)
		Whole plant Aghada Whole plants Root	Contraceptives Delivery	1 tea spoon paste orally given twice a day for 4 days in empty stomach. Root paste is applied on hypogastrium to relieve excessive labour pain.
6	<i>Achyranthes aspera</i> L. Amaranthaceae			Fresh and dried root is grinded and decoction is made with water and given to pregnant women for relief in painful delivery. Root powder is taken with cow milk to relieve menstrual disorder.
		Root	Menstruation	Fresh leaf decoction given orally for 7-15 days once or twice a day to cure amenorrhoea and dysmenorrhoea
7	<i>Adhatoda vasica</i> L. Acanthaceae	Leaf	Amenorrhoea	
		Root bark	Leucorrhoea	Root bark juice is taken with honey. Decoction of 5-7 leaves mixed with 1 gm seeds each of <i>Dacus carota</i> and <i>Raphanus sativus</i> is taken to regulate menstrual cycle.
8	<i>Adina cordifolia</i> Benth & Hook.f. Rubiaceae	Haldu Stem bark	Burning Sensation in Urine	Decotation of Haldu bark and Aonla ( <i>Emblica officinalis</i> ) bark is prepared and kept in glass bottle. One glass of decotation is taken orally.
9	<i>Aerva lanata</i> (Linn.) Juss. ex Schult. Amaranthaceae	<i>Chaya, Tore-ara</i> Root	Abortifacient	Fresh root (9 Inch) is used as astick for inducing abortion for terminating pregnancy up to 4 months.
10	<i>Albizia lebeck</i> (Linn.) Benth.	Shirish Stem bark	Contraceptive	The aqueous extract of bark is used (2 tea spoon daily for one week before menses) against conception in women.
11	<i>Ailanthus excela</i> Simaroubaceae	Maharukh Leaves	Contraceptives	A glass of leaf infusion taken orally once in day in the menstruation cycle period.
12	<i>Allium cepa</i> L. Liliaceae	Kanda, Pyaz: Bulb- Fruit bark- <i>Terminalia arjuna</i>	Contraceptives	1 teaspoonful bulb paste is prepared in combination with <i>Terminalia arjuna</i> (Roxb. Ex Dc.) Wight & Arn. fruit bark and <i>Allium sativum</i> L. bulb and given orally twice a day for 3 days.
13	<i>Allium sativum</i> L. Liliaceae	Lasahan Bulb	Contraceptives	1 teaspoonful bulb paste is prepared in combination with <i>Terminalia arjuna</i> (Roxb. Ex Dc.) Wight & Arn. fruit bark and <i>Allium sativum</i> L. bulb and given orally twice a day for 3 days.
		Korphad Dried leaves	Abortifacient	
14	<i>Aloe barbadensis</i> Mill. Liliaceae	Leaf	Abortifacient	Dried leaves are powdered and mixed with water, 2 tea spoons, twice daily given orally in empty stomach for 3 days.
		Dried juice	Contraceptives	Pulp of leaves with black salt is taken (1g daily) for abortion Dried juice is mixed with fresh <i>Hibiscus rosa-sinensis</i> L. flower, hing and adrak. The paste is taken orally one teaspoon twice a day for 5 days with honey.
15	<i>Alternanthera philoxeroides</i> (Mart.) Griseb. Amaranthaceae	Leaf	Lactation	Leaf pulp and turmeric paste is applied on breasts to cure swelling during early lactation. Leaf is chopped and given to the women before 2 day of delivery for easy delivery.
		Alligator weed, Pankati	Delivery	
16	<i>Amaranthus. viridis</i> Linn Ameranthaceae	Stem/ twig	Abortifacient	A woman take piece of fresh plant 9 inch twig is used as stick with Hing, at the top of the stick tip, take stick and keep the whole things over night inside to induce abortion
		Matala, Tandala	Contraceptive	Fresh root (10 g ) is eaten women before two days copulation antifertility agent
17	<i>Ananas comosus</i> (L.) Merr. Bromeliaceae	Ananas	Abortifacient	1 tea spoon paste of leaves is orally given twice a day for 3 days in empty stomach. .Fruit Ripened fruit is used to induce abortion
		Fresh leaves	Abortifacient	
18	<i>Annona reticulata</i> L. Annonaceae	Ramphal Unripe fruit/ Seed	Abortifacient	½ tea spoon paste of unripe fruit is taken orally with a cup of warm water, twice a day for 2 days. One teaspoon if seed paste is given orally on empty stomach for 3-5 days. A mixture of seed powder with black pepper powder ( <i>Piper nigrum</i> ) (about 3 gm) is prescribed for spoiling of pregnancy up to 3-4 months duration.
		Seed	Abortifacient	
19	<i>Annona squamosa</i> L. Annonaceae	Sitaphal Root	Abortifacient	Dried root powder(5 gm) is taken once in the morning for five days by women for abortion of 3 to 4 months of pregnancy.
20	<i>Aristolochia indica</i> Linn. Aristolochiaceae	Indian Birthwort, Kida mari Toot	Abortifacient	A woman take piece of fresh plant 9 inch twig is used as stick with Hing, at the top of the stick tip, take stick and keep the whole things over night inside to induce abortion

21	<i>Argemone mexicana</i> L. Papaveraceae	Pivala dhotara	Leucorrhoea	Leaf Leaf juice is taken by women twice a day for 15 days as a cure for Leucorrhoea.
22	<i>Argyrea nervosa</i> Burm. F. Convolvulaceae		Delivery	Leaves are placed on the earlobes of women to facilitate detaching of placenta after delivery.
		Shatavari	Lactation	
		Root	Leucorrhoea	Dried root powder is taken with honey or milk to treat lactation problems.
23	<i>Asparagus racemosus</i> Willd. Liliaceae	Root	Galactagogue	Root decoction is given to the women suffering from leucorrhoea. 5-10 ml of juice is given two twice for three weeks after delivery as Galactagogue. Excess Bleeding during menstrual discharge and burning sensation in urine
		Root and stem	Menstruation	
		Neem	Abortifacient	
		Stem bark		One teaspoonful stem bark paste is taken orally on empty stomach, for a week.
		Root bark	Leucorrhoea	Root bark juice is taken with honey.
24	<i>Azadirachta indica</i> A. Juss. Meliaceae	Leaf	Menstruation	Warm leaves are applied on hypogastrica to relieve painful menstruation.
		Stem bark	Menstruation	Stem bark grind it with water, add 100ml in 100 ml butter milk and consumed to control excessive Menstrual bleeding. 1 teaspoon is taken after menses before copulation, make the women sterile. Some time oil is also inserted into vagina before copulation.
25	<i>Bacopa monnieri</i> Pennel Scrophulariaceae	Fruit	Contraceptive	
		Bramhi	Gonorrhoea	Plant extract is taken to treat gonorrhoea.
26	<i>Bauhinia variegata</i> L. Caesalpiniaceae	Kachanar	Menstruation	Stem bark decoction is given in menorrhagia.
		Stem bark		
27	<i>Biophytum sanctivum</i> L. Oxalidaceae	Tipani.	Contraceptives	
		Leaves	Leucorrhoea	Leaves paste two teaspoonful taken orally on empty stomach.
28	<i>Boerhavia diffusa</i> Linn.Nyctaginaceae	Punarnava	Delivery	Whole Plant Decoction of plant (15 ml) is given once a day in the early morning for fifteen days for the treatment of leucorrhoea. Take extract from the roots and mix a little bit of oil of Til. Application of this preparation in the uterus ensures smooth delivery. Roots are dried and made into powder and 2 g is given to pregnant women abortion
		Kate Savar, Shamali	Abortion	
		Stem bark	Abortifacient	
			Delivery	
29	<i>Bombax ceiba</i> L. Bombacaceae	Root	Menstruation	Tablets are prepared from ½ tea spoon paste and taken twice a day for 5 days. Stem bark powder is given with water to increase labour and for smooth delivery. Pasty mass of fleshy roots of young plant (1 gm) mixed with un boiled cow milk (2 ml) is taken once a day in the early morning for a week by women to regulate irregular menstruation. Paste of flower bud (2g) mixed with honey and taken orally for a week to regulate menstrual cycle. 5-10 capsules apocarpas after grinding with raw sugar taken thrice daily for 10 days) . Induces sterility in man.
		Flower bud	Menstruation	
			Sterility in man	
30	<i>Borassus flabellifer</i> L. Arecaceae	Fruit	Sterility in man	
		Palm	Contraceptive	Ash (after burning of male inflorescence) with powder of black pepper ( <i>Piper longum</i> ) & cow milk in the ratio 2:1:1 is prescribed women as contraceptive for few days.
		Inflorescence	Abortifacient	
		Dried seed		Dried seed paste of <i>Solanum</i>
		Palas		<i>xanthocarpum</i> Schrad, fresh <i>Coccinia grandis</i> (L.) Voigt stem, dried seed of <i>Vitex negundo</i> L., <i>Caesalpinia pulcherrima</i> (L.) Sw., <i>Holarrhena antidysenterica</i> (L.) Wall., <i>Rubia cordifolia</i> L., fresh seed of <i>Ricinus communis</i> L., fresh seed of <i>Saraca asoca</i> (Roxb.) W. J. De Wilde dried fruit of <i>Sapindus mukorossi</i> Gaertn. are prepared separately and mixed in equal ratio. Tablets are then prepared from this mixture, one tablet contain ½ spoon of the mixture. 1 tab daily after dinner for 7 days.
31	<i>Butea monosperma</i> (Lam.) Taub. Fabaceae	Leaf	Miscarriage	One leaf is boiled in milk; the leaf is discarded and milk is given to women to clean the uterus. Used to prevent bleeding after delivery.
		Flower	Delivery	
		Root and Bark	Leucorrhoea	Half spoon of Powder of dried flower is mixed with Honey and taken orally.
		Inflorescence		Inflorescence is dried and taken (3 g daily for 15 days) possess contraceptive properties
			Contraceptive	
32	<i>Canabis sativa</i> L. Cannabaceae	Leaf	Delivery	Used as a pain killer at the time of delivery
33	<i>Cardiospermum helicacabum</i> L. Sapindaceae	Karavi	Menstruation	Leaf extract is taken to relieve menstrual disorder and irritable uterus.
		Leaf		
34	<i>Caesalpinia bonduc</i> Roxb. Caesalpiniaceae	Kachkada, Sagargoti	Delivery	Seed powder is given to women suffering from puerperal fever.
		Seed		
35	<i>Caesalpinia pulcherrima</i> (L.) Sw Caesalpiniaceae	Shankasur	Abortifacient	Tablets are prepared from ½ tea spoon bark paste and taken twice a day for 5 days. Bark juice (2 ml) is administrated orally on empty stomach for the first three months.
		Stem bark		
36	<i>Calotropis gigantean</i> L. Asclepiadaceae	Rui, Ruchkin, Ruimodra	Leucorrhoea	Root decoction of root (3 ml) with paste of <i>Piper longum</i> (1 gm) is given to women in empty stomach for ten days for treatment of leucorrhoea.
		Root		Root decoction (3 ml) with Piper longum paste (1 gm) is given to women in empty stomach for continuous 10 days once a day for treatment of leucorrhoea and irregular menstruation cycle.
		Root	Menstruation	
37	<i>Calotropis procera</i> (Aiton) W.T.Aiton Asclepiadaceae	Rui, Ruchkin, Ruimodra	Contraceptive	Fresh root paste is prepared and then mixed with root paste of <i>Mimosa pudica</i> L. in equal ratio. Tablets are prepared from the paste mixture. One tablet contains ½ tea spoon paste. 1 tablet daily at empty stomach after completion of menstrual cycle.
		Root		
38	<i>Capparis decidua</i> (L.) Hiern. Capparidaceae	Borathi	Contraceptive	1/2 cup of whole plant decoction taken orally for 3 days stomach.
		Whole plant		

39	<i>Citrullus colocynthis</i> L. Cucurbitaceae	Indravan Root Papai Root	Delivery Abortifacient	Root paste made with cow milk is applied on hypogastrium for easy delivery. 10 cm long root of male plant in 1 liter of water and make a decoction, mixed with one spoon of charred elephant dung and consume three times in a day to induce Abortion.
40	<i>Carica papaya</i> L. Caricaceae	Tender fruit	Galactagogue	Tender fruit is cooked with white rice or ragi as food for a week. Tender or ripened Raw fruit is taken orally cause abortion for the first three months.
41	<i>Chenopodium ambrosioides</i> L. Chenopodiaceae	Fruit Chil Leaf	Abortifacient Menstruation	Leaf decoction given to treat painful menstrual flow.
42	<i>Crataeva magna</i> (Lour.) DC Capparidaceae	Varun Stem bark	Contraceptive	1/2 cup of whole plant decoction taken orally for 3 days by women.
43	<i>Cardiospermum helicacabum</i> L. Sapindaceae	Kanphuti Whole plant	Contraceptive	Whole plant decoction given orally two teaspoon on empty stomach
44	<i>Carica papaya</i> L. Caricaceae	Papai Seeds/ Latex	Contraceptive	Fresh or dried seeds paste is prepared. 2 tea spoon paste decoction taken every day after menstrual period till commencement of next menstrual period. 10-15 ml of latex of raw fruit is given orally once a day for 3 days.
45	<i>Cassia alata</i> L. Caesalpinaceae	Wayani Leaves	Abortifacient	Tablets are prepared from leaf paste. One tablet contains 1 spoon of that paste. 2 tabs, twice daily for 3 days.
46	<i>Cassia fistula</i> L. Caesalpinaceae	Bahava Stem bark	Menstruation	Paste of stem bark or powder (2 tea spoonful) mixed with black pepper is given to women for 7 days to treat menstrual disorders.
47	<i>Catharanthus roseus</i> (L.) G. Don Apocynaceae	Sadafully Leaf	Leucorrhoea and menorrhagia	Leaf juice (5 ml) mixed with honey is given in the early morning for continuous 7 days once a day to treat leucorrhoea and menorrhagia.
48	<i>Centella asiatica</i> (Linn.) Urban Apiaceae	Brhami Leaf	Menstruation and syphilitic ulcers	Leaf juice (2 spoonful) mixed water is given for 7 days is empty stomach to treat irregular menstruation and syphilitic ulcers.
49	<i>Clerodendrum phlomidis</i> L.f. Verbenaceae	Arani	Lactation Leucorrhoea	Leaf paste is applied to increase lactation. Root decoction is given in leucorrhoea.
50	<i>Citrullus colocynthus</i> (Linn.) Schrader Cucurbitaceae	Indravan Root	Delivery	Grind the roots of <i>Citrullus colocynthus</i> (Indravan) with water and apply it to navel of the pregnant woman. It ensures smooth delivery. The moment the childbirth is complete the application of the above preparation should be removed otherwise the ovary may get ejected.
51	<i>Cissus quadrangularis</i> Linn. Vitaceae	Hadsakal Stem	Menstruation	Stem juice used to cure irregular menstruation.
52	<i>Convolvulus microphyllus</i> Sieb. ex Sreng. Convolvulaceae	Dodak Whole plant Whole plant	Leucorrhoea Menstruation Gonorrhoea	Whole plant paste with equal amount of <i>misri</i> and milk is taken. Plant paste with equal amount of <i>misri</i> and milk is taken.
53	<i>Corchorus depressus</i> C. Chr. Tiliaceae	Kurund		Leaf extract is externally applied on women genital organ for treatment.
54	<i>Coriandrum sativum</i> L. Apiaceae	Dhaniya, Kothimbir Seed	Sterility in man	Seeds powder (95-10g daily) taken with water reduces sexual desire and make the man sterile.
55	<i>Costus speciosus</i> Sm. Costaceae	Panacha onwa Seed	Abortifacient	Seed (mature seeds) pastes are used to prepare tablet containing 1/2 tea spoon paste. 2 tablet twice a day before meal for 3 days.
56	<i>Crateva nutela</i> Buch-Ham. Capparaceae	Stem bark	Contraceptive Abortifacient	Fresh juice of stem bark (3 ml) mixed with seed powder of <i>Pipernigrum</i> (1 gm) is taken by women in the 7th day of the menstrual cycle as a contraceptive.
57	<i>Curculigo orchioides</i> Gaertn. Hypoxidaceae	Musali Tuber	Promoting Sexual Desire & Strengthening Wound of umbilical code	Tuber of the tuber is given orally in empty stomach. Powder of dried Kalimusli ( <i>Curculigo orchioides</i> ), Kalimirch and Illaichi is prepared in tablet form. Two capsule is taken in morning and evening after meal.
58	<i>Curcuma longa</i> L. Zingiberaceae	Halad	Contraceptive Contraceptive	Dried rhizome powder and cotton cloth ash is mixed with coconut oil used as an antiseptic on the wound of umbilical code. Powder of turmeric (10-15 g taken with water after menses for 5 days) induces sterility in women
59	<i>Cuscuta reflexa</i> Roxb. Cuscutaceae	Amarwel Whole plant	Contraceptive Contraceptive	Fresh plant paste is prepared separately and mixed with leaves paste of <i>Stephania japonica</i> (Thunb.) Miers in equal volume and Tablets are prepared from it, one tablet contain 1/2 spoon paste. 2 tabs twice a day in empty stomach for 7 days. Seeds of the plant are given (3 g after menses) to induce sterility in women.
60	<i>Cynodon dactylon</i> (L.) Pers. Poaceae	Seed Durva Whole plant	Contraceptive Contraceptive	Tablets are prepared from leaf paste. One tablet contains 1 spoon of that paste. 2 tabs, twice daily for 3 days. Whole plant paste and bud of <i>Punica granatum</i> is taken with filtrate of boiled rice in scanty and irregular periods.
61	<i>Dalbergia sisoo</i> Roxb. Papilionaceae	Whole plant Shisam	Menstruation Leucorrhoea Contraceptive	Tender leaves made paste are taken with <i>misri</i> and milk.
62	<i>Dioscorea bulbifera</i> L. Dioscoreaceae	Batata Kand Whole plant		Whole plant paste is prepared and mixed equally with <i>Ficus religiosa</i> L. leaves paste. 32 Tablets are then prepared from this mixture and one tablet contain 1-2 tea spoon mixture and is taken twice a day till commencement of next menstrual cycle. Root paste used to treat birth control. 2 spoonful root paste mixed with cow milk and administered to both men and women early in the morning for continuous 15 days to increase sexual desires.
63	<i>Diplocyclos palmatus</i> L. Cucurbitaceae	Tuber Shivlingi Seed	Increase sexual desires Contraception	Seed of Shivlingi, Sonth, Kalimirch, Putrajivi and Root bark of Vat is made in powder. 2-5 gms. powder is taken with water or milk at night. Once daily for 21 days. After completion or beginning of menstrual cycle
64	<i>Dolichos trilobus</i> L. Fabaceae	Whole plant	Abortifacient	Whole plant juice is used to induce abortion in the first three month.
65	<i>Datura metel</i> L. Solanaceae	Dhotara Whole plant	Abortifacient	Fresh root paste decoction of is prepared and 2 teaspoon decoction is taken once a day for 5 days in empty stomach.

	Amala Fruit	Abortifacient	
66	<i>Emblica officinalis</i> L. Euphorbiaceae		A mixed paste of fruit along with <i>Terminalia chebula</i> Retz., <i>Phyllanthus emblica</i> L., <i>Terminalia bellerica</i> Roxb., are prepared. Rasanjan is added to this mixture. Tablets are prepared from this and one tablet contains 6 ratimixtures. 1 tab daily once for one month. Fruit pulp mixed with <i>Tribulus</i> fruit powder is taken with honey. Fruit and seed dust (5 gm) mixed with honey administered for 7-10 days in empty stomach early in the morning to cure menorrhagia an gonorrhoea.
	Fruit pulp	Leucorrhoea	
	Fruit, seed	Menorrhagia and gonorrhoea	
67	<i>Ferula assa-foetida</i> L. Apiaceae	Hing Latex	Contraceptive
68	<i>Ficus glomerata</i> Roxb. Moraceae	Gular	Gonorrhoea
69	<i>Ficus hispida</i> L.F. Moraceae	Bhuiumber Umbar Leaves	Lactation Contraceptive
70	<i>Ficus religiosa</i> L. Moraceae		Leaves paste is prepared and mixed equally with <i>Ficus religiosa</i> L. leaves paste. Tablets are then prepared from this mixture and one tablet contain 1-2 tea spoon mixture and is taken twice a day till commencement of next menstrual cycle. 50 gram of fresh fruit is taken and mixed with honey and taken 2 week as contraceptive.
71	<i>Gloriosa superba</i> L. Liliaceae	Fruit Kallawi/ Khadyanag Root tuber	Contraceptive Abortifacient
	Kapas Fresh roots	Contraceptive	
72	<i>Gossypium herbacium</i> L. Malvaceae	Root bark	Abortifacient
	Root	Menstruation	
73	<i>Hemidesmus indicus</i> (L) R. Br. Asclepiadaceae	Anantmul Root	Leucorrhoea
	Jaswand Flower	Abortifacient	
74	<i>Hibiscus rosa-sinensis</i> L. Malvaceae	Stem Bark	Abortifacient
	Stem Bark	Contraceptive	
75	<i>Holarrhena antidysenterica</i> (L.) Wall. Apocynaceae	Kuruchi Seed	Abortifacient
76	<i>Ipomoea paniculata</i> (L) R. Br. Convolvulacea e	Bhuikumra Root	Menorrhagia, gonorrhoea, spermatorrhoea
77	<i>Jatropha curcus</i> Euphorbiaceae	Jangali errand Fruit	Abortifacient
	Mehandi Leaves	Contraceptive	
78	<i>Lawsonia inermis</i> L. Lythraceae		Paste of fresh leaves is prepared and mixed with little amount of esabgul powder. Tablets arethen prepared from ½ tea spoon mixture, taken twice daily for 21 days from last menstrual period. Root bark decoction is given for leucorrhoea.
79	<i>Leucas aspera</i> Spreng. Lamiaceae	Root bark Fresh stem and roots	Leucorrhoea Abortifacient
80	<i>Mangifera indica</i> L. Anacardiaceae	Amba Stem bark	Leucorrhoea
81	<i>Mentha arvensis</i> L. Lamiaceae	Pudina Leaf	Contraceptive
82	<i>Menya spinosa</i> Roxb. Rubiaceae	Menya Fruit and seeds	Abortifacient
83	<i>Martynia annua</i> L. Pedaliaceae	Devils's claws, Whole plant	Contraceptive
84	<i>Michelia champaca</i> L. Magnoliaceae	Champa Stem bark, flower, fruit	Menstruation
	Lajalu Whole plant	Abortifacient	
85	<i>Mimosa pudica</i> L. Mimaceae		Whole plant paste is prepared and then mixed with root paste of <i>Mimosa pudica</i> L. in equal ratio. Tablets are prepared from the paste mixture. One tablet contains ½ tea spoon paste. 1 tablet daily at empty stomach after completion of menstrual cycle. Fruit juice is given orally twice a day for 5 days on the first three month. Root paste (1 tea spoonful) mixed with honey administered for 7 days early in the morning to cure vaginal and uterine complaints.
	Fruit	Abortifacient	
	Root	Uterine complaints	
86	<i>Momordica charantia</i> L. Cucurbitaceae	Karale Seed	Contraceptive

87	<i>Moringa oleifera</i> Lam. Moringaceae	Shewaga Roots	Contraceptive	Leaves paste is prepared and mixed with paste of fresh <i>Moringa oleifera</i> Lam. root and in equal ratio. ½ tea spoon mixture is used to prepare 1 tablet and is taken daily in empty stomach after completion of menstrual cycle. Root and bark (1 tea spoonful) mixed with warm milk is given for 15 days to induce abortion of women, menstrual disorders and several venereal diseases.
88	<i>Mucuna pruriens</i> (Linn.) DC. Fabaceae	Root and stem bark Khaj kuhiri Seed	Menstruation Leucorrhoea, menorrhagia and impotency	A pill prepared from powdered seeds boiled with cow milk mixed with Kamraj ( <i>Buettneria herbacea</i> ) rot dust, sugar and honey is given to cure leucorrhoea and menorrhagia. Said pill is very effective both for men and women in case of impotency.
89	<i>Nerium indicum</i> L. Apocynaceae	Kanher Root	Abortion	The roots of the plant are procured for abortion and internal administration.
90	<i>Nelumbo nucifera</i> Gaertn. Nelumbonaceae	Kamal Whole plant Rhizome	Contraceptive Whole plant Menstruation	A cup of whole plant extract taken orally by male. Decoction of rhizomes of white flowered plant (pundi-salukid), about 15 ml is taken by women in empty stomach for fifteen days to cure white discharge. 4-5 tender leaves are taken with pepper.
91	<i>Nyctanthes arbor-tristis</i> L. Nyctaginaceae	Parijatak	Menstruation	
92	<i>Ocimum sanctum</i> L. Lamiaceae	Tulas Leaf	Delivery	Leaf juice is taken with <i>gur</i> and cow milk to relieve pain after delivery.
93	<i>Opuntia dillenii</i> Haw. Cactaceae	Pansabar	Gonorrhoea	Baked fruit juice is taken with honey to treat gonorrhoea.
94	<i>Piper betle</i> L. Piperaceae	Nagin pan Stem	Abortifacient	Stem paste decoction of <i>Piper betle</i> L. is prepared and 1 teaspoon decoction is taken daily once in empty stomach for 7 days.
95	<i>Pedalium murex</i> L. Pedaliaceae	Gokharu	Leucorrhoea	Fruit powder mixed with <i>Khand</i> (powdered sugar) and <i>Ghee</i> is taken
96	<i>Phyllanthus niruri</i> Hook. f. Euphorbiaceae	Bhuiawala Root	Menstruation	Root paste is taken with filtrate of boiled rice to regulate menstruation.
97	<i>Plantago ovata</i> Forsk. Plumbaginaceae	Ispaghool Seed	Abortifacient	Seed and husk mucilage (5 g daily early in the morning) is taken orally for the termination of pregnancy.
98	<i>Plumbago indica</i> L. Plumbaginaceae	Chitrak Roo	Abortifacient	Root paste (1 tea spoonful) mixed with honey is given early in the morning in case of abortion. It is also used to treat syphilis.
99	<i>Plumbago zeylanica</i> L. Plumbaginaceae	Kaduvil Chitrak Fresh root	Abortifacient	5-6 pieces of Fresh root are dipped in a glass of cold water for 10 mins and 2 tea spoon infusion is taken twice a day for a single day. Root 3-5 cm of root paste is taken orally to induce abortion. Root decoction is used as abortifacient. Intake of 10 gms of roots of <i>Plumbago zeylanica</i> ( <i>Chitrak</i> ) with honey ensures quick delivery.
100	<i>Pterocarpus marsupium</i> Roxb Fabaceae	Root Bija Bark	Delivery Leucorrhoea and menorrhagia	Paste of bark (1 tea spoonful) mixed with honey used to cure leucorrhoea and menorrhagia of women.
101	<i>Punica granatum</i> L. Lythraceae	Dalimb Seeds	Contraceptive	One teaspoonful seed powder taken orally once in a day on empty stomach.
102	<i>Polyalthia longifolia</i> Thw. Annonaceae	Ashoka Root	Menstruation	Root bark powder is given in menstrual disorder.
103	<i>Polygonum glabrum</i> Willd. Polygonaceae	Neli Root	Contraceptive	One teaspoonful root pates given orally.
104	<i>Rauvolfia serpentina</i> L. Bail. Apocynaceae	Sarpagandha Root	Abortifacient	Tablets are prepared from 10 gm paste of fresh rhizome in combination with 5gm paste of <i>Rauvolfia serpentina</i> Bail. 3 tablets, 3 times daily in empty stomach for 3 days. Grind the roots of <i>Rauvolfia serpentina</i> ( <i>Sarpagandha</i> ) and make 10 gms of its preparation. Intake of this preparation results in early delivery. This treatment invigorates and excites the ovary and consequently delivery comes through.
105	<i>Ricinus communis</i> L. Euphorbiaceae	Root Erand Seed	Delivery Abortifacient	20g fresh seeds paste is prepared. 2 tea spoon seed paste decoction, twice daily for 3 days. Seed oil is given to relieve constipation during pregnancy. Warm leaves are applied on hypogastria.
106	<i>Rubia cordifolia</i> L. Rubiaceae	Leaf Mangishtha Seed	Menstruation Abortifacient	Same as <i>Butea monosperma</i> (Lam.)
107	<i>Solanum xanthocarpum</i> Schrad. Solanaceae	Ran wange Seed	Abortifacient	Same as <i>Butea monosperma</i> (Lam.)
108	<i>Sapindus mukorossi</i> Gaertn. Sapindaceae	Ritha Seeds	Abortifacient	Same as <i>Butea monosperma</i> (Lam.)
109	<i>Saraca asoca</i> (Roxb.) W. J. De Wilde Fabaceae	Ashok Seed	Abortifacient	Same as <i>Butea monosperma</i> (Lam.)
110	<i>Sida cordifolia</i> L. Malvaceae <i>Semecarpus anacardium</i> L. Anacardiaceae	Stem bark Kharanti	Menstruation Gonorrhoea.	Stem bark decoction is taken to relieve menstrual disorder and haemorrhoids of uterus. Seed decoction is given for gonorrhoea.
111	<i>Sesamum indicum</i> L. Pedaliaceae	Bhilava Seed, gum	Menorrhagia	Seed dust (2 gm) mixed with honey and cow milk applied to treat menorrhagia and other venereal diseases like syphilis etc. Bark from gum believed to cure venereal diseases.
112	<i>Smilax zeylanica</i> L. Smilacaceae	Til Seeds Seeds	Abortifacient Menstruation	Half grounded seeds mixed with ghee & sugar are taken with hot milk. Mixture of half grounded seeds, <i>Gur</i> and <i>Ghee</i> is taken with milk to relieve amenorrhoea.
113	<i>Solanum torvum</i> Sw. Solanaceae	Root	White Discharge	A decoction is made with water and taken orally after completion of menstrual discharge
114	<i>Solanum surattense</i> Burm. F Solanaceae	Hirve Wange Leaf	Abortifacient	Leaf 3-5 ml Leaf extract is given orally for 5days
115	<i>Striga gesnerioides</i> (Willd.) Vatte Scrophulariaceae	Kateri wange Whole plant	Contraceptive	Paste or dust (5 gm) mixed with water applied for 7 days to promote conception and to cure gonorrhoea.
116	<i>Strychnos nux-vomica</i> L. Loganiaceae	Tavi Whole plant	Abortifacient	One cup hot water extract of whole is taken for a single day
117	<i>Tamarindus indica</i> L. Caesapiniaceae	Stem Chinch, Imali Fruit	Leucorrhoea Abortifacient	Pasty mass stem (3 gm) with Kusum ( <i>schleihereaoleosa</i> ). oil ( 1 ml) is prescribed twice after food for ten days continuously for the treatment of leucorrhoea. One cup hot water extract of fruit is taken for a single day.
118	<i>Tephrosia purpurea</i> (L.) Pers. Fabaceae	Harankhuri Leaf	Delivery	5 ml leaf decoction mixed with 2 ml honey is prescribed to women twice a day continuously for one month against post natal complications.

120	<i>Tecomella undulata</i> Seem. Bignoniaceae	Stem bark	Menstruation	Stem bark powder is given to women suffering from excessive bleeding.
		Arjun	Abortifacient	
121	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn Combretaceae	Fruit		Tablets are prepared from fresh fruit paste. One tablet contains 5g mixture. Tablets are the dried for 1 day. 2 tabs twice a day in empty stomach for 7 days. Stem bark powder is taken with water
122	<i>Terminalia bellerica</i> Roxb. Combretaceae	Stem bark Fruit	Leucorrhoea Contraeptive	A mixed paste of fruit along with <i>Terminalia chebula</i> Retz., <i>Phyllanthus emblica</i> L., <i>Terminalia bellerica</i> Roxb., are prepared. Rasanjan is added to this mixture. Tablets are prepared from this and one tablet contains 6 ratimixtures. 1 tab daily once for one month.
123	<i>Terminalia Chebula</i> Retz. Combretaceae	Fruit bark	Contraeptive	A mixed paste of fruit along with <i>Terminalia chebula</i> Retz., <i>Phyllanthus emblica</i> L., <i>Terminalia bellerica</i> Roxb., are prepared. Rasanjan is added to this mixture. Tablets are prepared from this and one tablet contains 6 ratimixtures. 1 tab daily once for one month.
124	<i>Thevetia peruviana</i> (Pers.) Schum. Apocynaceae	Pivali Kanher Seed	Abortifacient	Seed paste decoction is prepared 1/4th tea spoon seed paste decoction with one tea spoon honey, daily at morning for 2-3 days. Root/ leaf decoction taken orally to cure urinary diseases.
125	<i>Trichodesma amplexicaule</i> DC. Boraginaceae	Root	Urinary diseases Miscarriage	Root juice is given to women, who have suffered a miscarriage. The recipe cleans the uterus.
126	<i>Triumfetta rhomboidea</i> Tiliaceae	Bhurat	Leucorrhoea	Root powder is used in leucorrhoea.
127	<i>Vitex negundo</i> L. Verbinaceae	Nirgudi Seed	Abortifacient	Same as <i>Butea monosperma</i> (Lam.) Taub.
128	<i>Withania somnifera</i> Dunal Solanaceae	Ashwagandha Stem bark	Menstruation	Stem bark powder is taken with <i>misri</i> and water to regulate menstrual disorder.
129	<i>Woodfordia fruticosa</i> (L.) Kurz, J Lythraceae	Dried flowers	Leucorrhea	Dried flower powder (5 gm with honey is given to women once a day for the treatment of leucorrhea
130	<i>Zea mays</i> (L.) Sweet Gramineae	Maka Unripened grains	Lactation	Half ripe grains are prescribed to increase lactation.
131	<i>Zingiber officinale</i> Rosc. Zingiberaceae	Adrak Rhizome	Contraceptive	Same as <i>Aloe barbadensis</i> Mill.
132	<i>Zizyphus mauritiana</i> Lamk. Rhamnaceae	Bor Root bark	Contraceptive	Root bark powder mixed with candy sugar is taken with milk (3-5 g twice a day) induces abortion. Stem bark Stem bark paste is taken twice a day after food as a cure for abdominal pain during pregnancy.
133	<i>Xanthium strumarium</i> L. Asteraceae	Stem bark Ardhshishi, Kutri Root/leaf	Abdominal pains in pregnancy Urinary Problems	Root/ leaf decoction taken orally to cure urinary diseases.

All the specimens collected will be serially numbered with field notes duly record in the fieldwork proforma.

Extensive and intensive tours of different localities especially the tribal villages and the hilly forest regions were undertaken in all seasons of the year 2016-2017. The tours will arrange in a phase manner so as to cover ethnobotanically important area of the North Maharashtra. Ethnobotanical information recorded in field notebook and such information confirmed by repeated changing method of questioning from the various tribal doctors, inhabitants, rural peoples, etc. During the field trips local guides, villager's medicine men and tribal heads were inquired regarding the local names, local uses, medical properties and edible uses of plant species.

#### Study area

The North Maharashtra region comprises Dhule, Jalgaon and Nandurbar districts. It is situated at North-East of Maharashtra bounded by Baroda districts of Gujrat from North and Nimar district of Madhya Pradesh form east, Jalgaon district from south and from west by Nashik distict of Maharashtra. The east region of Maharashtra has Satpuda which is rich in vegetation having humid and semi-evergreen species. The middle region of it North Maharashtra has many deciduous species whereas western region has only dry scrub in Madhya Pradesh, it breaks into a low woodland or scrub elsewhere.

**Dry deciduous forest:** These are the forest of Satpuda hills on the northern side of the Tapi River. It contribute Chopda, Yawal and Raver ranges. The rainfall in this region is about 70-101 cm. the dominant species consist of *Tectona grandis*, *Acacia cathechar*, *Anogissus latifolia*, *Terminalia tomentosa*, *Boswellia serrata*, *Terminalia arjuna*, *Butea monosperma*.

**Scrub forest-** the forest on the Southern side of Tapi River and are mostly scrub type. The average rainfall varies from 38-63 cm, in summer temperature goes up to 48<sup>0</sup> C therefore the vegetation is poor. The main plant species are *Acacia catechue*, *Anogissus latifolia*, *Boswellia serra ta*, *Hardwickia binata* and *Zyzipus zuzuba* etc.

#### MATERIAL AND METHODS

The ethnomedicinal published data has been collected through various sources and were analysed in order to show the differences and similarities in the usage and treatment behaviour adopted by various tribes of North Maharashtra for curing gynaecological disorders. The analysis reveals local name of species, part of plant used by traditional healers and the method of treatment by different tribal communities of North Maharashtra. Species were scientifically identified by their botanical names.

**Interviews and botanical collections:** Interviews were conducted with local people and traditional healers of Bhil, Kokani, Vasave, Gavit, Pawara, Katkari and Mahadeo-koli community for the study and documentation of the plants used in contraception and abortion. Extensive field survey of different parts of the four districts was done to document information. A total of 82 traditional healers were interviewed using structured questionnaire. Plants were collected after interaction with traditional healers and local people during 2014-2015 during their different flowering periods. Information about the local name of the plants, parts used, preparation of drug, doses and mode of uses in controlling population growth were collected from the traditional healers. Plants were collected and pressed for herbarium; vouchers were identified with the help of standard floras (Patil, 2003

and Patil, M. 2006). The data collected in the field were formatted and preserved carefully. Voucher specimens were deposited in the herbarium, Department of Botany, Jijamata College, Nandurbar-425412.

## RESULT AND DISCUSSION

Our Earth is under the pressure of population explosion. In this regard, W.H.O. and other health organizations have put great notice on the search for a safe form of contraception which will be cheap and socially acceptable. Great attention is being given to plants with anti-fertility properties. The people of North Maharashtra (Four districts) have rich traditional knowledge in the field of ethnomedicine which are forming a strong base for primary health care system. In the present study, 133 medicinal plants from 44 families along with 68 formulations are recorded and documented which are used for family planning in North Maharashtra.

As the work has reported 35 new plants as human Contraceptives agents along with other 22 known plants, it may be of significant importance to explore further for isolation and characterization of novel active contraceptive agents.

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