



REVIEW ARTICLE

Traditional Medicine/Plants for the Treatment of Reproductive Disorders in Asia Nations

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ABSTRACT

Traditionally, ethnomedicine plays a vital role for curing various diseases in Asian nation's specially rural and ethnic peoples for its lucrative and ease of use. For primary health care, 70-80% of the peoples in the developing countries rely on medicinal plant and the tendency of using ethnomedicine was also gradually increasing in the developed countries as it has almost no side effect. Traditional medicine plays an important role in the management of reproductive health problems of the Asian native population due to socioeconomic and geographical factors. Recently, attention of many pharmaceutical companies and researchers has been focused on medicinal plants, especially dietary products, as a wealthy resource for drug discovery and development because of the merit of diversified health benefits and therapeutic potentialities due to the presence of pharmacologically active compounds. Here, we benchmark the traditional herbal remedies for treatment of reproductive disorders to both human and animals with their identified molecular mechanisms and possibilities of further research as candidate for future drug discovery and development.

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INTRODUCTION

Since ancient time, traditional medicine/plants play a vital role for curing various diseases in Asian nation's tribal and rural peoples of Bangladesh, China, India, Nepal, and Vietnam as well as South Korea and Japan (Hossen *et al.*, 2015a; Hossen *et al.*, 2015b) for its lucrative and ease of use (Lai *et al.*, 2012). In villages, ethnic people of many countries in Asia mainly depend on medicinal plants for their primary health care due to the socioeconomic and geographical background. In the developing countries, for primary health care, 70-80% of the peoples rely on medicinal plant and the tendency of using ethnomedicine was also gradually increasing in the developed countries as it displays almost no side effect (Luitel *et al.*, 2014; Hossen *et al.*, 2016). On the basis of the need, observation, and previous experience of the community people, ethnic people depend on the medicinal plants around them to acquire knowledge of economic values and medicinal properties of many plants and

traditional medicine (Malla *et al.*, 2015; Azhar *et al.*, 2015; Gull *et al.*, 2015). About 25% of modern medicines are developed from traditionally used medicinal plant sources; and research on ethnomedicinal herbal plants lead to discovery of 75% of herbal drugs (Wang *et al.*, 2003). Over 21,000 plant species were recorded by World Health Organization (WHO) for their medicinal uses throughout the world (Anonymous, 2002b).

Ayurvedic medicine (also known as Ayurveda) is Indian traditional medicine recognized as complementary and alternative medicine (Baliga, 2010). Despite the lacking of scientific verification of the effectiveness and the safety of medicinal plants, but due to cost-effectiveness and lacking of side effects, the use of ethnomedicine is becoming more popular as a complementary and alternative medicine (Nasir *et al.*, 2015; Hossen *et al.*, 2015c). In recent decades, the attention of pharmaceutical companies and researchers has been focused on medicinal plant as a wealthy resource for drug discovery and development because of

the merit of diversified health benefits and therapeutic potentialities due to the presence of pharmacologically active compounds. Each herb has its own unique combination and properties (Hossen, 2015; Hossen *et al.*, 2015d; Malla *et al.*, 2015). Besides the documenting of ethnomedicinal value of medicinal plant, molecular evidence based scientific validation of traditional medicinal plant has become important path of modern research. Though medicinal plants possess enormous ethnomedicinal value and reported to be used as traditional medicine to cure many diseases, but scant information about reproductive diseases is available.

In this review, therefore, we focus on the traditional medicine/ herbal plants used for the treatment of reproductive disorders in Asian countries with their identified molecular mechanisms and possibilities of further research as candidate for future drug discovery and development.

Advanced studies are needed to focus on effective doses of active medicinal plants/compounds for clinical trials and should be focused on explanation of bioavailability, permeability, and safe doses to offer natural active compounds from medicinal plants as most prospective novel candidates for future reproductive therapy.

Traditional medicine used for male reproductive disorders: For treating spermaturia the herbal preparation of *Centella asiatica*, *Hemidesmus indicus*, *Hibiscus eosa*

sinensis, *Dracaena terniflora*, *Phyllanthus fraternus*, and *Cuminum cyminum* are used. *Evolvulus alsinoides* and *Ocimum sanctum* are used to increase sperm count. Whole *Withania somnifera* is used to treat impotency (Table 1).

Traditional medicine used for female reproductive disorders: For the treatment of leucorrhoea, *Celastrus paniculatus* and *Hibiscus rosa-sinensis* were used. To treat menorrhagia, *Clerodendrum viscosum* and *prema latifolia* have been used. A range of herbs including *Ensete superbum*, *Mirabilis jalapa*, *Securinega leucopyrus*, *Celastrus paniculatus*, *Gardenia gummifera*, *Zizyphus oenoplea*, *Erythrina indica*, *Ixora coccinia*, and *Zizyphus rugosa* was identified to treat miscarriage. *Ocimum basilicum* and *Tabernaemontana divaricata* were applied to treat dysmenorrhoea. *Wrightia tinctoria* and *Diospyros montana* were claimed to be generally useful in treating various menstrual disorders and irregularities (Table 2).

The plants used in male and female reproductive disorders are arranged in alphabetical order of diseases with their botanical names. The parts used for preparation method of drug, and dose and duration of the treatment have also been provided. Information about the other ingredients, if any, is also given wherever available (Table 1 and 2). The family name, reported medicinal use, and pharmacology for the described plants are summarized in Table 3 and 4.

Table 1: Traditional medicine/ medicinal plants used for the treatment of male reproductive disorders

Ailments/ Male reproductive disorders	Plant name	Parts/s used	Preparation and dosage	Mode of action	References
Blood stain urine	<i>Calendula officinalis</i> (Asteraceae)	Flower	Infusion taken orally	Reduced malondialdehyde (MDA)	Sewani-Rusike and Mammen (2014); Verma <i>et al.</i> (2015)
*Spermaturia	<i>Centella asiatica</i> (L.) Urb	Whole plant	Equal quantities of ingredients are crushed in fresh milk. This mixture is given in the morning, once a day for a week	Neuroprotective activity	Chandrika and Kumarab (2015); Hegde <i>et al.</i> (2007)
	<i>Dracaena terniflora</i> Roxb.	Roots	2-3 spoons of decoction is given twice a day for a week		Hegde <i>et al.</i> , (2007)
	<i>Phyllanthus fraternus</i> Webster.	Whole plant	20 g of the plant crushed with a spoonful of jeerige. This mixture in milk is given twice a day for 8 days	Antioxidative, Antibacterial, antifungal	Hegde <i>et al.</i> (2007); Mehta (2014); Upadhyay <i>et al.</i> (2014)
Male impotency	<i>Withania somnifera</i> (L.)Dun	Root	Paste is prepared in rice washed water and one spoon a day is taken for 45 days	Reduced tumor cell proliferation.	Hegde <i>et al.</i> (2007); Kadir <i>et al.</i> (2012); Winters (2006)
	<i>Centella eriantha</i> (Apiaceae)	Root	Decoction taken orally or grind and mix with water than apply topically.		Sewani-Rusike and Mammen (2014)
Male circumstition to heal wound	<i>Helichrysum pedunculatum/nodifolium</i> (Asteraceae)	Leaves	Prepare paste and apply topically.	Antibacterial	Meyer and Dilika (1996); Sewani-Rusike and Mammen (2014)
To increase sperm count	<i>Evolvulus alsinoides</i> L.	Whole plants	Crushed plant is boiled in water till it reduces to half. This decoction is taken twice a day for a month	Anti-amnsic, antistress, antimicrobial	(Hegde <i>et al.</i> (2007); Singh (2008)
	<i>Ocimum sanctum</i> L.	Seeds	Crushed seeds are boiled in half cup of milk. This is given twice a day for 10 days	Antibacterial, antifungal Analgesic, antispamodic and adaptogenic	Hegde <i>et al.</i> (2007); Pattanayak <i>et al.</i> (2010)
Testicular tumors	<i>Hypoxis hemerocallidea</i> (Hypoxidaceae)	Root corn	Paste and applied topically		Afolayan and Otunola (2014); Mogatle (2009); Sewani-Rusike and Mammen (2014)

*: *Hemidesmus indicus*(L.)schult. *Hibiscus rosasinensis* L. also used for treatment of Spermaturia

Table 2: Traditional medicine/ medicinal plants used for the treatment of female reproductive disorders

Ailments / Female reproductive disorders	Plant name	Parts/s used	Preparation and dosage	Mode of action	References
All types of menstrual disorders	<i>Saraca asoka</i> (Roxb.) De willd.	Bark	Decoction is given once a day for 8 days	Antimicrobial	Hegde <i>et al.</i> (2007); Rajith <i>et al.</i> (2012); Sainath <i>et al.</i> (2009)
Amenorrhoea	<i>Saraca asoka</i> (Roxb.) De willd.	Bark	Paste is taken one spoon/day for a week		
AIDS/HIV infections	<i>Hypoxis hemerocallidea</i> (Hypoxidaceae)	Root corn	Cooked and taken with food	Antiretrovirals	Peltzer <i>et al.</i> (2011); Sewani-Rusike and Mammen (2014)
	<i>Sutherlandia frutescens</i> (Fabaceae)	Leaves and flower petals	Infusion or decoction taken orally	Active against HIV target enzymes,	Harnett <i>et al.</i> (2005); Sewani-Rusike and Mammen (2014)
Blood stain urine	<i>Calendula officinalis</i> (Asteraceae)	Flower	Infusion taken orally	Antibiofilm, antibacterial and antioxidant	Ghaima <i>et al.</i> (2013); Sewani-Rusike and Mammen (2014)
Bleeding of pregnant women	<i>Anisotes ukambensis</i> (Acanthaceae)		Bark		Gakuya <i>et al.</i> (2013).
Dysmenorrhoea	<i>Ocimum basilicum</i> L.	Bark	Crushed in milk and given once in morning for 7 days		Hegde <i>et al.</i> (2007); Karousou and Deirmentzoglou (2011).
	<i>Tabernaemontana divaricata</i> (L.) R. Br.	Fresh Leaves	Crushed and mixed with buttermilk. This is taken once a day for 3 days		Hegde <i>et al.</i> (2007); Poornima <i>et al.</i> (2013)
Leucorrhoea	<i>Celastrus paniculatus</i> willd	Root /Bark	Root/bark is crushed in milk and given once a day for a week		Hegde <i>et al.</i> (2007); Singh, (2015)
	<i>Hibiscus rosa-sinensis</i> L.	Leaves	Crushed leaves is mixed with milk and filtered. Half a cup of filtrate is given in a day for 7 days		Hegde <i>et al.</i> (2007); Rao <i>et al.</i> (2010)
Low breast milk production	<i>Portulaca oleracea</i> (Portulacaceae)	Leaves	As an infusion taken orally		Haq <i>et al.</i> (2011); Sewani-Rusike and Mammen (2014).
Menorrhagia	<i>Clerodendrum viscosum</i> vent.	Leaves	Crushed leaves are mixed with milk. Half a cup of this milk is taken once a day for 8 days		Haque <i>et al.</i> (2000); Hegde <i>et al.</i> (2007)
Menstrual irregularities	<i>Wrightia tinctoria</i> R.Br.	Root	Equal quantity of pastes from both is mixed and given once a day for 10 days.		Bapuji and Ratnam (2009); Hegde <i>et al.</i> (2007).
	<i>Diospyros montana</i> Roxb.	Root			Hegde <i>et al.</i> (2007); Poornima <i>et al.</i> (2013).
Menstrual pain	<i>Zingiber officinale</i>	Root	In food or as infusion taken orally		Sewani-Rusike and Mammen (2014).
Menorrhagia and associated weakness	<i>Premna latifolia</i> Dalz.	Fresh leaves	Decoction is given once a day in the morning for 5 days	Antioxidant	Bharti <i>et al.</i> (2012); Hegde <i>et al.</i> (2007); Umarji and Deepa (2011)
Misconception and early abortion	<i>Ensete superbum</i> (Roxb.) cheeseman.	Seeds	Powdered seeds are given in milk once a day for 9 days		Hegde <i>et al.</i> (2007)
Miscarriage and misconception	<i>Mirabilis jalapa</i> L. <i>Securinega leucopyrus</i> (Willd.) Muell <i>Celastrus paniculatus</i> willd. <i>Gardenia gummifer</i> L.F. <i>Zizyphus oenoplea</i> mill. <i>Erythrina indica</i> L.	Roots	Crushed in milk and given once in morning for 5 days. Pastes of each is made separately and finally mixed in equal proportion. 2 spoons of this mixture is given in morning for 45 days		Hegde <i>et al.</i> (2007)
	<i>Ixora coccinea</i> L. <i>Zizyphus rugosa</i> lamk.	Bark Root			
Urinary infection	<i>Aqathosma apiculata</i> (Rutaceae)	Root	Chew or make an infusion and drink.		Sewani-Rusike and Mammen (2014)
Cervical cancer	<i>Aspalatus linearis</i> (Fabaceae)	Leaves and roots	Boils and drink as tea		Sewani-Rusike and Mammen (2014)

Table 3: Effects of medicinal plants on reproduction/other pharmacological activities

Scientific name (Family)	Medicinal Use	Identified pharmacological Activities
<i>Celastrus Paniculatus</i> Willd. (Celastraceae)	Used in anemia, as emmenagogue, aphrodisiac and abortifacient (Jain, 1991; Nadkarni, 1976)	Aphrodisiac, brain stimulant and memory enhancing activities (Jain, 1991; Nadkarni, 1976)
<i>Centella asiatica</i> (L.) Urb. (Apiaceae)	Used in anaemia and nervine disorders, as cooling agent, tonic and blood purifier (Jain, 1991)	Antifertility, sedative, antispasmodic and hypotensive (Sharma et al., 2000)
<i>Ensete superbum</i> (Roxb.) Cheeseman. (Musaceae)	Used in debility and weakness, as coolant (Nadkarni, 1976)	Antifertility and uterine stimulant activities (Dutta et al., 1970).
<i>Hibiscus rosa sinensis</i> L. (Malvaceae)	Used in menorrhagia, seminal weakness, uterine and vaginal discharges and menstrual complaints (Nadkarni, 1976)	Anti-fertility, anti-estrogenic anti-ovulatory activity in rats (alcoholic and benzene extracts) (Gupta, 2003; Yelne et al., 2002)
<i>Ocimum bacilicum</i> L. (Lamiaceae)	Used in gonorrhoea, as aphrodisiac and emmenagogue (Nadkarni, 1976)	Antimicrobial, <i>in vitro</i> anti-HIV and antioxidant properties (Gupta, 2003)
<i>Ocimum sanctum</i> L. (Lamiaceae)	Used in debility and weakness, genito-urinary ailments, as aphrodisiac, blood purifier and cooling agent (Nadkarni, 1976)	Antispasmodic, aphrodisiac, antimicrobial, immunostimulatory activities (Anonymous, 2002a).
<i>Phyllanthus fraternus</i> Webster. (Euphorbiaceae)	Used in allergy, gonorrhoea, and genitor-urinary disorders (Jain, 1991)	Antibacterial, antispasmodic, and uterine relaxant activities (Rastogi, 1998)
<i>Saraca asoka</i> (Roxb.) De willd. (Caesalpinaceae)	Used in uterine infections, menorrhagia and other menstrual complaints, as tonic (Jain, 1991; Nadkarni, 1976)	Oxytocic, uterotonic, antioestrogenic properties and used against menorrhagia (Gupta, 2003; Sharma et al., 2001).
<i>Withania somnifera</i> (L.) Don. (Solanaceae)	Used in general and seminal debility, spermatorrhoea, as aphrodisiac and diuretic (Nadkarni, 1976)	Hypotensive, relaxant, aphrodisiac, antispasmodic activities (Gupta, 2003)

Table 4: Plants with known medicinal uses in reproductive diseases

Botanical name (Family)	Local name	Reported medicinal uses	References
<i>Clerodendrum viscosum</i> vent. (Verbenaceae)	Taggi	Used in syphilis and as a tonic.	Jain (1991);
<i>Cuminum cyminum</i> L. (Apiaceae)	Jeerige	Used in gonorrhoea, as a tonic, emmenagogue and coolant	Nadkarni (1976)
<i>Diospyros Montana</i> Roxb. (Ebenaceae)	Balagane	Used in menorrhagia and as an abortifacient	
<i>Erythrina indica</i> L. (Fabaceae)	Bili Haalivaana	Used in menorrhagia and as an aphrodisiac and emmenagogue	
<i>Evolvulus alsinoides</i> L. (Convolvulaceae)	Vishnukraanthi	Used in debility, syphilis, leucorrhoea, spermatorrhoea and as an aphrodisiac	
<i>Gardebia gummifera</i> L.f. (Rubiaceae)	Bikke	Used in dyspepsia and as an antiseptic and tonic	
<i>Hemidesmus indicus</i> (L.) Schult. (Asclepiadaceae)	Haala balli	Used in leucorrhoea, impotency, menstrual complaints, spermatorrhoea, as a tonic, aphrodisiac and cooling agent	
<i>Ixora coccinea</i> L. (Rubiaceae)	Hole daasaala	Used in gonorrhoea, leucorrhoea, and dysmenorrhoea	
<i>Mirabitis jalapa</i> L. (Nyctaginaceae)	Madhyaahna mallige	Used in debility, as a tonic and aphrodisiac	
<i>Premna latifolia</i> Dalz. (Verbennaceae)	Naravala	Used in gonorrhoea and as a diuretic	
<i>Securinega leucopyrus</i> (Willd) Muell. (Euphorbiaceae)	Bilihooli	Antimicrobial agent	Sharma et al. (2001)
<i>Tabernaemontana divaricata</i> L. (R.Br.)	Najabattala	Used in strangury and as a tonic	Jain (1991);
<i>Wrightia tinctoria</i> R.Br. (Apocynaceae)	Kodasa	Used in seminal weakness, as a tonic and aphrodisiac	Nadkarni, (1976)
<i>Zizyphus oenoplea</i> Mill. (Rhamnaceae)	Parige	Used as a blood purifier.	
<i>Zizyphus rugosa</i> lamk. (Rhamnaceae)	Mullannu	Used in menorrhagia and to treat syphilis.	

Table 5: Effect of medicinal plant/traditional medicine in different reproduction diseases model and their potential uses

Types of disorders/molecular signalling pathway	Plants/traditional medicine	Anti-reproductive disorders effect	References
Paroxetine-induced sexually impaired male rats.	Oral administration of <i>Allium cepa</i> bulb ethyl acetate fraction (200 mg/kg for 7 days)	Restored the normal sexual behavior	Malviya et al. (2013)
Testicular torsion-detorsion ischemia-reperfusion injury of the testis.	<i>Psoralea corylifolia</i> was administered orally	Decreased malondialdehyde level and significantly increased CREMt expression and spermatogenesis	Wei et al. (2011)
Oxitocin-induced uterine contraction in mice	Xiang-fu-si-wu decoction.	Blocking Ca ⁺² channel	Liu et al. (2011)
Spermatogenesis cycle in rat	Juice of <i>Allium cepa</i> bulbs (0.5 and 1g/rat/day)	Increase LH level, Increase sperm number, viability and motility	Khaki et al. (2009)
Germline signalling pathway (<i>Caenorhabditis elegans</i>)	<i>Morus alba</i> L Polyphenols	Inhibit Transcription factor: DAF-12, DAF-16, PHA-4, and NHR-80 Target gene: fat-6, lip1-4, sod-3, unc-51, and fard-1	Zheng et al. (2014)
Pregnant Swiss mice	<i>Byrsonima verbascifolia</i> hydromethanolic extract	Mutagenicity or immunostimulation	Gonçalves et al. (2013)
Male infertility (maneb-induced toxicity in male reproductive function)	<i>Basella alba</i> and <i>Carpolobia alba</i> Extract	Stimulated testosterone and improve fertility	Manfo et al. (2014)

Table 6: Identified ethnoveterinary uses of medicinal plants for treatment of reproductive diseases

Family	Species	Indication	Plant part used	Chemical constituents
Araliaceae	<i>Cussonia spicata</i>	Bark used for retained placenta in stock, leaves used treat endometritis and/or vaginitis in cows	Leaves, bark	Antibacterial, anti-inflammatory, mutagenic (Luseba et al., 2007; McGaw et al., 2007)
Asparagaceae		Retained placenta in cows (Dold and Cocks, 2001); sores, red water, uterine infections (Van der Merwe et al., 2001)	Roots, tubers	
Asphodelaceae	<i>Aloe thimarloi</i>	Retained placenta, dystocia	Leaves	Antibacterial, anti-inflammatory, mutagenic
Asphodelaceae		Retained placenta, in cows	Leaves	
Aspidiaceae	<i>Dtyopteris athamantica</i>	Retained placenta in cows (McGaw and Eloff, 2008)	Rhizome decoctions	
Combretaceae		Fertility problems (Luseba and Van der Merwe, 2006)	Root bark	
Diocoreaceae	<i>Dioscorea sylvatica</i>	Swollen udders and uterine problems in cows (McGaw and Eloff, 2008)	Lotions from boiled crushed inner parts of tubers	Diosgenin (McGaw and Eloff, 2008)
Ebenaceae	<i>Diospyros mespiliformis</i>	For milk production (Luseba and Van der Merwe, 2006)	Bark	
Euphorbiaceae	<i>Croton gratissimus</i>	Fertility enhancement (Van der Merwe et al., 2001)	Leaves, roots	
Fabaceae	<i>Acacia decurrens</i> willd.	Hastens oestrus (Masika et al., 2000)	Bark decoction Bark leaves	
Gunneraceae	<i>Gunnera perpensa</i> L.	Used to facilitate expulsion of afterbirth in animals and women (McGaw and Eloff, 2008)	Roots	
Htacinthaceae	<i>Urginea sanguinea</i> schinz			
Hypoxidaceae	<i>Hypoxis hemerocallidea</i>	Retained placenta (Van der Merwe et al., 2001)	Corms	
	<i>Hypoxis rigidula</i>	Fertility enhancement, general ailments, heart water, abortion (Van der Merwe et al., 2001)		
Malvaceae	<i>Hibiscus malacospermus</i>	Retained placenta, (Masika et al., 2000)	Root decoction	
Moraceae	<i>Ficus sur</i>	Root decoctions for retained placenta in cows	Leaves, bark roots	Bark may contain tannin (Hutchings, 1996)
Oleaceae	<i>Olea europaea</i> L.	Leaves used for endometritis and vaginitis in cows. (Dold and Cocks, 2001)	Leaves bark	
Pedaliaceae	<i>Dicerocaryum eriocarpum</i> <i>Dicerocaryum senecioides</i>	Dystocia, drench for retained placenta	Aerial parts, roots whole plants	
		(Luseba and Van der Merwe, 2006; Van der Merwe et al., 2001)		
Pedaliaceae	<i>Harpagophytum procumbens</i>	Retained placenta (Van der Merwe et al., 2001)	Fruit	
Rhamnaceae	<i>Ziziphus ucronata</i> Willd.	Fertility enhancement	Roots, leaves	
Rubiaceae	<i>Pentanisia prunelloides</i>	Retained animal or	Root decoctions	
Salicaceae		Retained placenta (Hutchings, 1996; Masika et al., 2000)	Decoction or infusion of unspecified parts root	
Sapindaceae	<i>Azima tetraacantha</i> Lam.	Dystocia in cows (Dold and Cocks, 2001)		
Sapotaceae	<i>Englerophytum magalismontanum</i>	Fertility enhancement (Van der Merwe et al., 2001)	Roots	
Solanaceae	<i>Solanum mauritianum</i>	Dystocia in cows (Dold and Cocks, 2001)	Roots	
Solanaceae	<i>Withania somnifera</i> (L.)	Used to stimulate milk production in cows	Unspecified parts, roots	Many compounds including choline, tropanol, glycowithanolides, withanolides, withaferine and withasomnine (Hutchings, 1996)
Tiliaceae	<i>Grewia flava</i>	Fertility enhancement (Van der Merwe et al., 2001)	Roots	
Tiliaceae	<i>Triumfetta sonderi</i> L.	Retained placenta (Van der Merwe et al., 2001)	Root bark	
Typhaceae	<i>Typha capensis</i>	Decoctions taken or applied externally to aid expulsion of afterbirth in animals and humans	Unspecified parts	Quercetin 3-dimethyl4-glucoside from leaf (Hutchings, 1996)
Urticaceae	<i>Pouzolzia mixta</i> solms	Retained placenta, bloat, vaginal discharge (Van der Merwe et al., 2001)	Roots leaves, stems	
Zygophyllaceae	<i>Tribulus terrestris</i> L.	Retained placenta.	Whole plant, aerial parts	

Molecular mechanisms of identified medicinal plants treated for reproductive diseases and prospective ethnoveterinary uses: Molecular mechanisms of identified medicinal plants for treating reproductive

diseases or treatment in clinical trials are highlighted in Table 5. In case of paroxetine-induced sexually impaired male rats, oral administration of *Allium cepa* bulb ethyl acetate fraction (200 mg/kg) for 7 days restored the

normal sexual behaviour (Malviya *et al.*, 2013), while *Psoralea corylifolia*, *Allium cepa*, *Basella alba*, and *Carpolobia alba* increased the spermatogenesis and male fertility (Khaki *et al.*, 2009; Manfo *et al.*, 2014; Wei *et al.*, 2011). *Byrsonima verbascifolia* hydromethanolic extract inhibited mutagenicity (Gonçalves *et al.*, 2013), whereas Xiang-fu-si-wu decoction inhibited oxytocin-induced uterine contraction in mice by blocking Ca⁺² channel (Liu *et al.*, 2011). Mulberry (*Morus alba* L.) leaf polyphenols inhibited the transcription of nuclear hormone receptors such as DAF-12, DAF-16, PHA-4, and NHR-80 of germ line signalling pathway in *Caenorhabditis elegans* (Zheng *et al.*, 2014). Identified ethnoveterinary uses of medicinal plants for treatment of reproductive diseases are listed in Table 6.

Conclusions: This review highlighted on the traditional herbal medicine uses for the treatment of reproductive disorders of human health in Asian countries as well as benchmarked the reported ethnoveterinary uses of medicinal plants for reproductive health of animals. The present documentation of medicinal uses of traditional herbals may serve to both record herbal practices to develop our knowledge and to understand the mechanisms of actions and their use in treating a range of reproductive disorders. This paper instigates to be a wide range of opportunities for ethnopharmacologists and wide range of scientists to explore indigenous herbs and to elicit phytochemical, pharmacological, and clinical uses. In advance studies, documenting herbal usage and expanding upon current knowledge will enhance the understanding view to experts in this field and hopefully give us a milestone for the development of safe, cost effective, and traditional treatments for a range of reproductive disorders.

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