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Plants Associated with Human Fertility and Child Birth in Una District of Himachal Pradesh (India)

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Abstract

The Shivalik ranges divide the plain and Himalayan Mountain peaks and housed many medicinal important plants. One of the densely populated parts of this region includes district Una of Himachal Pradesh which has been thoroughly explored to identify the traditional knowledge in relation to plants associated with human fertility and childbirth-related problems in modern society. Infertility may account for many cases of "unexplained" fertility problems due to one or both partners. The present study revealed that people rely on total 24 plants species within 24 genera, belonging to 19 families that are utilized for various types of human fertility problems and child birth. Out of the total 19 family reported, the family Fabaceae leading with three species, followed by Lauraceae, Poaceae, and Zingiberaceae with two species each. The recorded species represent trees (11 species), shrubs (06), herbs (05), and climbers (02). The present information indicates the use of indigenous knowledge of the local people regarding the use of plant-based medicines to boost natural fertility, helps to maintain a healthy pregnancy, and is also recommended before and after parturition for easy delivery and will tone the uterus and nourish the blood.

Keywords: Aphrodisiac, Child birth, Ethnobotany, Human fertility, Una

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Introduction

Plants have been an integral part of human life and culture since the dawn of life on this earth.[1] The real indigenous culture of any nation is reflected through traditional knowledge and folklore. The statement of Carlous Linneaus "Man, ever desirous of knowledge, has already explored many things, but more and greater still remains concealed; perhaps reserved for far distant generations, who shall prosecute the examination of their creator's work in remote countries and make many discoveries for the pleasure and convenience of life…." explained that human traditional knowledge still left unexplored.

According to Schultes,[2] ethnobotany is "the study of the relationship which exists between people of primitive societies and their plant environment," whereas Acharya and Shrivastava[3] states it as the scientific study of the relationships that exist between people and plants, focusing primarily on how plants are used, managed and perceived across human societies. This includes use for food, clothing, currency, ritual, medicine, dye, construction, cosmetics, and more. Since the beginning of civilization, people have used plants as medicine. Perhaps as early as Neanderthal man, plants were believed to have healing powers. Indigenous societies all over the world in different geographical regions have discovered multiple uses of natural resources in the form of traditional knowledge. National Health Portal[4] also cited that herbs have been used for hundreds of years to treat every ailment that exists, as plants were the only medicine available to our ancestors for the survival of human race. The present paper focus the potential of plant associated with human fertility and child birth in Una district of Himachal Pradesh.

Prevalence of Fertility Problems

Glenville[5] reported in his finding that the majority of couples will conceive within a year of having regular intercourse without contraception, for others it may take longer, but as a general rule, if a woman under the age of 35 has not conceived within a year of trying, and woman over 35 has not conceived after approximately 6 months, medical opinion should be sought.

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The Human Fertilization and Regulatory Authority[6] listed various factors responsible for infertility that includes: Tubal disease - damage which has often been caused by infection or inflammation. Ovulatory disorders - hormonal imbalances such as hyperprolactinemia, polycystic ovarian syndrome, primary ovarian failure, endometriosis, uterine factors - anatomical abnormalities, fibroids (dependent on position), and inadequate uterine blood flow. However, there are many other factors which can affect fertility (both male and female) and may well account for many cases of 'unexplained' fertility problems. These include infrequent sexual intercourse or intercourse not coinciding with a woman's most fertile time. Irregular menstrual cycles, endocrine problems such as thyroid, diabetes, anemia, immunological factors, and sexually transmitted infection such as chlamydia or mycoplasma, ureaplasma, lifestyle factors - alcohol, caffeine, nicotine and recreational drugs, poor nutrition, stress and emotional issues, environmental hazards, for example, exposure to house hold chemicals, age, and body weight – overweight and underweight.[5,7]

Plant Associated with Human Fertility

Fertility is the basis of life, the foundation of the health and wealth of a community. To our ancestors, the mysteries of life and death

were solely in the hands of the Gods and the gift of life and fertility was their blessing to grant or to withhold. In all known cultures of the past-Egyptian, Babylonian, Jewish, Chinese, Indus-Valley, etc., the use of herbs as a source of medical treatment is the most traditional way of battling against infertility. Every tradition had important herbs prized for their value in helping conception to take place. Several magico-religious beliefs and herbal practices associated with fertility are known in many cultures across the globe. Particularly in India, tree worship associated with fertility rites is common and several plants are worshipped by the women for the gift of children.[8] Offerings are made to particular trees to ask their blessing and aid for conception.[9] Different trees respectively are asked either a boy or a girl. Sometimes different parts of the same tree are symbolically associated with either male or female fertility.[10] Herbal medicine is less invasive and safer than the expensive and often distressing modern infertility treatments that many couples embark on. Herbs can help to regulate the menstrual cycle, balance hormone levels, improve blood flow to the uterus, encourage ovulation, release endorphins to help with menstrual pain and premenstrual tension, rebalance general physical and emotional health.[11]

Materials and Methods

Ethno-medico-botanical surveys of Una district, Himachal Pradesh were conducted during 2018–2020. Out of the total land area, that is, 1540 km^2 of this district, only 185 km^2 under forest cover and inhabited by 5.21 lac population as per 2011 census. All tribe has their own customs and tradition, languages, and beliefs. In this study, the ethnomedicinal information practiced by the different ethnic communities of the region was collected through field visits in different seasons in remote areas inhabited by different ethnic communities as per the procedure delineated by Jain.[12] The information was gathered from the remote and inaccessible areas, where the record of the use of those traditional plants for treatment has been continuing to date. The data on different species of plant were mainly collected from the old female obstetricians, traditional healers, and old women and men through semi-structured interviews. The data collected were verified and cross-checked by showing plant specimens to various informants and even to the same informants on different occasions. The collected plant material used ethnomedicinally was identified with the help of treatises on Indian flora and carefully matched with authentic specimens housed in the herbarium of Northern Circle of Botanical Survey of India and F.R.I., Dehradun. Preliminary identification of those collected plant materials; information regarding their mode of use and their local names were recorded with the help of these traditional medicine practitioners and village elders and were further confirmed from Chowdhery and Wadhwa.[13] For further authentication, the International Plant Name Index[14] and the Plant List[15] were also consulted. The data were summarized and enumerated in the light of already published literatures.[7,13-21]

Study Area

The Una district of Himachal Pradesh lies in its south western part having geo coordinates longitude 75.55'2" – 76.28'25" (East) latitude 31.17'52" – 31.55'0" (North) with altitude ranges from 350 m to 1200 m. The district has four sub-division, which further divided into five tehsil, that is, Una, Amb, Bangana, Haroli, Ghanari, and seven sub-tehsil (Bharwain, Ispur, Jol, Dulehar, Bihrukalan, Kaloh, and Mehatpur Basdehra) and five development blocks [Figures 1 and 2]. It is bounded by district Kangra and Hamirpur toward north, and district Bilaspur lays toward its east, and toward the southwest by the State of Punjab.[22] "Chintpurni" Goddess temple, Dera Baba Barbhag Singh, Dera Baba Rudru, Joggi Panga, Dhunsar Mahadev Temple Talmehra, and Shivbari Temple are the famous religious destination of Una. Mehatpur, Gagret, Tahliwal, and Amb are main industrial centers of Una. The area is still

Figure 1: Location of Una in Himachal Pradesh (Incite: location map of H.P. in India)

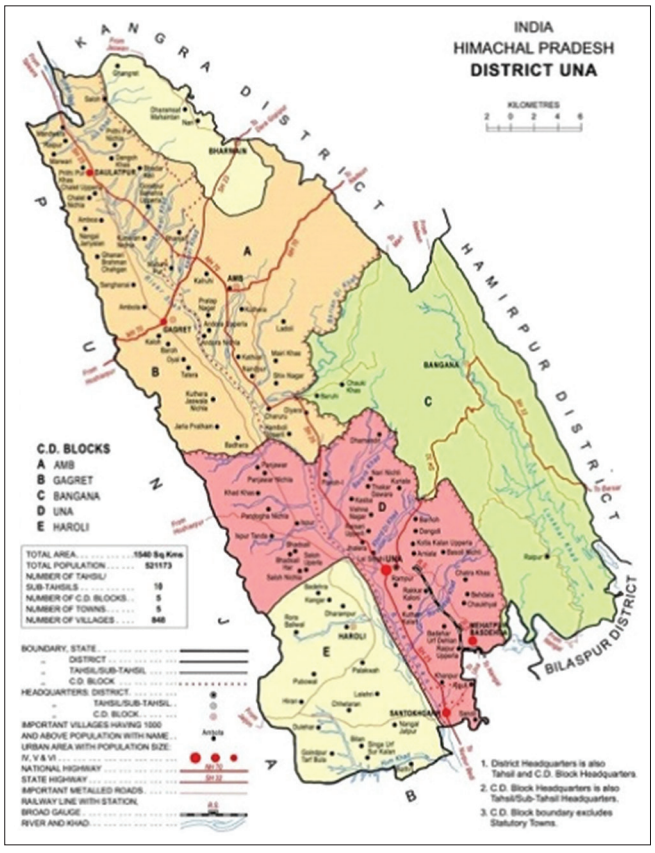

Figure 2: Map of Una[22]

predominantly rural and agrarian with about 75% of the workforce employed in agriculture and allied activities. The people here speak Hindi, Punjabi and Pahari languages.

In this region, the average temperature ranges from 4°C to 46°C and receives a mean annual rainfall of about 1060 mm. It has a diverse landscape made of hills, valleys with predominant zone, terraces. There are three main hill ranges, that is, *Chamukha Dhar* (borders with Hamirpur district), *Dhionsar Dhar* and *Ramgarh Dhar*. Soan or Swan River, a tributary of river Satluj, flowing in southeastern direction and divides the district into two parts. *Lunkhar Khad*, debouches in the Govind Sagar, a largest man-made Lake. Major part of soil ranges from alluvial to non-calcic brown consisting of arenaceous rocks, namely, sandstone, siltstone, and gravel boulder beds[22]

Data Collection and Analysis

After the complete survey among the different tribes the folk lore information of 24 such plants has been identified which were being used in various modes for their aphrodisiac, fertility, and child birth for long time. Some noteworthy plants species which are used in the treatment of various fertility related problems are *Bauhinia variegata, Blainvillea acmella, Desmostachya bipinnata, Prunus cerasoides, Tinospora cordifolia, Withania somnifera, etc.*

B. variegata L.

(Synonyms: *B. variegate var. candida* Voight; *Phanera variegata* (L.) Benth.)

Family: Fabaceae

Vernacular Names: Karale, Kachnar

Regional Names:

- English: Orchid tree, Camel's foot tree; Mountain-ebony; Poor-man's orchid;
- Hindi: Gwair, Kachnar, Kaniar, Padrain;
- Sanskrit: Gabdari, Girija, Kachanara.

Distribution: Native of Eastern Asia (India, China); widely planted in the tropics and warm regions of the world.

Flowering and Fruiting: March–August.

Description: A deciduous tree up to 15 m tall, with a spreading crown. Leaves alternate, long petioled, thin-leathery, simple but deeply cleft at apex, forming 2 large rounded lobes; Flowers showy, fragrant, in clusters near stem tips, appearing during leaf fall. Fruit a flat, oblong pod, 10–15 seeded.

Part Used: Bark

Folk Use: Powdered bark is given to cure swelling of uterus.

Spilanthes acmella (L.) L.

Family: Asteraceae

Vernacular Names: Karkara.

Regional Names:

- English: Para Cress Flower;
- Hindi: Kakranda, Karkara.

Distribution: Throughout India, ascending upto 1700 m.

Flowering and Fruiting: May–August.

Description: Annual herb. Leaves opposite, stalked, ovate-lanceolate, toothed. Flower heads conical, solitary on long stalk and with yellow flowers.

Part Used: Flowers.

Folk Use: Flowers powdered along with Kesar, Jaiphalm, Laung and Aphim. This powder is mixed with honey and tablets are made. One tablet is administered a day to improve male reproductive health.

Citrus medica L.

Family: Rutaceae

Vernacular Names: Bijora Nimbu

Regional Names:

- English: Citron tree;
- Hindi: Bijora, Nimbu, Limbu, Narangi, Neembu;
- Sanskrit: Beejpur, Mahnimbu, Matalunga, Vanabijapura.

Distribution: Indigenous to northeast India and adjacent areas.

Flowering and Fruiting: April–September.

Description: A shrub or small tree having irregular straggling branches, stiff twigs and long spines at the leaf axils. Leaves are with slightly serrate edges, ovate-lanceolate or ovate elliptic. Flowers generally unisexual. The clustered flowers are purplish tinted from outside or white-yellowish. Fruits obovoid with a leathery rind.

Part Used: Seeds.

Folk Use: 2–3 g powdered seeds are given with cow's milk to the women desirous of baby boy.

*D. bipinnata (*L.*)* Stapf

(Syn.: *Eragrostis cynosuriodes* (Retz.) P. Beauv.; *Poa cynosuriodes* Retz.)

Family: Poaceae

Vernacular Names: Kusha.

Regional Names:

- English: Halfa grass, Big cordgrass, Salt reed-grass;
- Hindi: Kusha.

Distribution: Mediterranean woodlands and shrublands.

Flowering and Fruiting: June–October.

Description: A tall, tufted perennial grass. Leaves alternate, entire, smooth, spinescent. Flowers green, purple. Fruit ovoid caryopsis with adherent pericarp.

Part Used: Roots.

Folk Use: Decoction of roots alongwith roots of *Cynodon dactylon* is prescribed for easy delivery.

*Diplocyclos palmatus (*L.*)* C. Jeffrey

(Syn.: *Bryonia laciniosa* L.; *Zehneria erythrocarpa* [F.] Muell)

Family: Cucurbitaceae

Vernacular Names: Shivlingi.

Regional Names:

- English: Lollipop Climber, Marble Vine;
- Hindi: Shivalingi, Put loguli, Bankakra;
- Sanskrit: Lingini.

Distribution: It is found in India, including the Himalayas, at altitudes of 200–1500 m.

Flowering and Fruiting: August-October.

Description: A perennial climber. Leaves are broadly ovate, palmately lobed. Flowers are small, white or yellowish, male in stalkless clusters of 2–8, along with five female flowers in the same axil. Fruit is solitary, or in clusters of 2–5, ovoid-round; when ripe, it is red with longitudinal white stripes.

Part Used: Seeds.

Folk Use: Powdered seeds taken with milk, twice daily to increase sperm count.

P. cerasoides D. Don

(Syn.: *Cerasus puddum* Roxb. ex Ser.; *Prunus majestic* Koehne; *P. puddum* (Roxb. ex Ser.) Brandis)

Family: Rosaceae

Vernacular Names: Paja.

Regional Names:

- English: Wild Himalayan Cherry, Dwarf Cherry;
- Hindi: Padam, Phaja;
- Sanskrit: Padmagandhi, Padmavriksha.

Distribution: Himalayas - from Himachal Pradesh to South west China and Burma, growing in the temperate forests from 1,200 to 2,400m in elevation.

Flowering and Fruiting: November–May.

Description: Deciduous tree. Leaves glossy, toothed. Flowers long-stalked, pink. Fruits ovoid, long, yellow or red.

Part Used: Bark.

Folk Use: 1–2 g powdered bark of given daily in empty stomach for conception.

Prunus granatum L.

Family: Punicaceae

Vernacular Names: Anar.

Regional Names:

- English: Pomegranate Tree;
- Hindi: Anar, Dhrimb;
- Sanskrit: Dantabijake, Pindapushpa, Vrittaphala.

Distribution: W. Himalaya, 700–2700 m.

Flowering and Fruiting: May–September.

Description: Deciduous shrub or small tree. Leaves are opposite or sub-opposite, glossy, narrow oblong, entire. Flowers are bright red, with four to five petals. Fruits woody, globular, brownish-orange.

Part Used: Flowers.

Folk Use: Decoction of flowers along with "Supari" prescribed for conception. Moreover, decoctions of flowers are given to regulate menstrual flow.

Saraca asoca (Roxb.) W.J. de Wild

(Syn.: *Jonesia asoca* Roxb.; *Saraca arborescens* Burm.)

Family: Fabaceae

Vernacular Names: Ashoka.

Regional Names:

- English: Ashoka Tree;
- Hindi: Ashok;
- Sanskrit: Karnapuraka.

Distribution: Throughout India in evergreen forests.

Flowering and Fruiting: March-September.

Description: A small, erect evergreen tree with deep green leaves growing in dense clusters. Flowers orange-yellow.

Part Used: Bark.

Folk Use: Decoction prepared by taking equal quantities of bark of *S. asoca* and *Bauhinia variegata* is prescribed as one teaspoon twice daily to cure leucorrhoea.

T. cordifolia (Willd.) Hook.f. and Thomson

(Syn.: *Cocculus cordifolius* (Willld.) DC.; *Menispemum cordifolium* Willd.)

Family: Menispermaceae

Vernacular Names: Gulja, Giloy.

Regional Names:

- English: Tinospora;
- Hindi: Giloe, Gulancha, Gulbel, Gurach, Gurcha;
- Sanskrit: Amrita, Amritalata, Guluchi, Madhuparnika.

Distribution: Throughout tropical India.

Flowering and Fruiting: May–July.

Description: A large glabrous climber. Stem succulent corky. Branches sending down slender pendulous fleshy roots. Leaves membranous, roundish, deeply cordate. Flowers yellowish-green.

Part Used: Stem.

Folk Use: Powdered stem mixed with powdered dry rhizome of *Zingiber officinale*, leaves of *Cinnamomun tamala*, bark of *Cinnamomum zeylanicum*, fruits of *Elettaria cardamomum*, fruits of *Syzygium aromaticum* and *Emblica officinalis*, roots of *Asparagus adscendens* and *Mishri*, boiled in milk, ghee and honey, and tablets are made. One tablet is prescribed twice daily for conception.

W. somnifera (L.) Dunal

(Syn.: *Physalis somnifera* L.; *Withania kansuensis* Kuang and A.M. Lu; *W. microphysalis* Suess.)

Family: Solanaceae

Vernacular Names: Paja.

Regional Names:

- English: Indian ginseng, Winter cherry;
- Hindi: Asgand, Ashwagandha, Punir;
- Sanskrit: Ashvagandha, Asvagandha, Turangigandha.

Distribution: Grows abundantly in India (especially Madhya Pradesh), Pakistan, Bangladesh, Sri Lanka and Parts of Northern Africa.

Flowering and Fruiting: November-February.

Description: An erect, evergreen shrub with simple, broadly ovate leaves. Flowers borne singly or in few-flowered axillary umbellate cymes. Berries orange-red.

Part Used: Stem.

Folk Use: 2–3 g powdered stem is prescribed for opening of closed fallopian tube.

Discussion

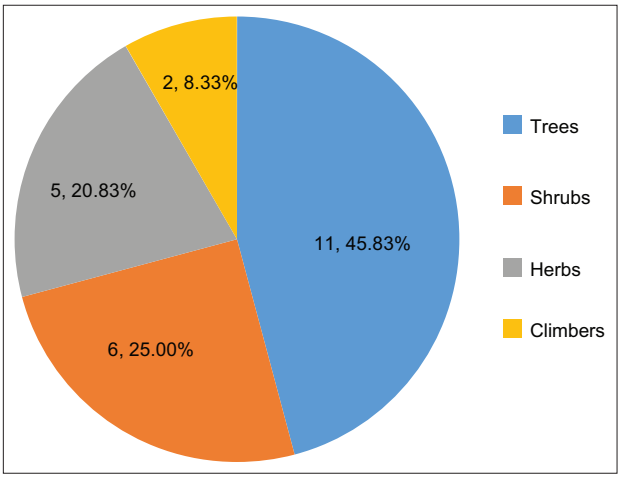

Figure 3: Habit-wise number and percentage disposition of plants associated with human fertility and child birth in Una district of Himachal Pradesh

Table 1: Plants used in fertility and child birth from District Una, Himachal Pradesh

Botanical Name	*Family*	*Vernacular Name*	*Habit*	*Part Used*	*Uses*
Asparagus adscendens Roxb.	Asparagaceae	Sanhastrapaud, Satavari	Shrub	Roots	Used in combination with other plants helps in conception
Bauhinia variegata L.	Fabaceae	Karale, Kachnar	Tree	Bark	To cure swelling of uterus
Boerhaavia diffusa L.	Nyctaginaceae	Ootshut	Herb	Roots	Body rejuvenation
Cinnamomum tamala (Buch.-Ham.) Th. G.G. Nees	Lauraceae	Tejpatra	Tree	Leaves	Helps in conception
Cinnamomum zeylanicum Blume	Lauraceae	Dalchini	Tree	Bark	Helps in conception
Citrus medica L.	Rutaceae	Bijora Nimbu	Tree	Seeds	Given with milk to women for accomplishing their wish of birth to boy
Cynodon dactylon (L.) Pers.	Poaceae	Doob	Herb	Root	Facilitate delivery
Desmostachya bipinnata (L.) Stapf.	Poaceae	Kusha	Herb	Root	Given in combination for easy delivery
Diplocyclos palmatus (L.) C. Jeffrey	Cucurbitaceae	Shivlingi	Climber	Seeds	To increase sperm count
Elettaria cardamomum (L.) Maton	Zingiberaceae	Elachi	Shrub	Fruit	Helps in conception
Emblica Officinalis Gaertn.	Euphorbiaceae	Amla	Tree	Fruit	Powder used in combination to helps conception
Glycyrrhiza glabra L.	Fabaceae	Mullathi	Shrub	Root	Maintains reproductive health of female
Mesua ferrea L.	Calophyllaceae	Nag Kesar	Tree	Flower	Used to cure leucorrhoea and menstrual trouble.
Myristica fragrans Houtt.	Myristicaceae	Jaiphal	Tree	Fruit	Improve male sexual disorders
Papaver somniferum L.	Papaveraceae	Aphim	Herb	Seeds	Maintain male reproductive health
Prunus cerasoides D. Don	Rosaceae	Paja	Tree	Bark	Given for conception
Prunus granatum L.	Punicaceae	Anar	Tree	Flower	Given for conception and to regulate menstruation
Putranjiva roxburghi Wall.	Putranjivaceae	Patajan	Tree	Fruit	Cure infertility
Saraca asoca (Roxb.) Wild	Fabaceae	Ashoka	Tree	Bark	To cure Leucorrhoea
Spilanthes acmella (L.) L.	Asteraceae	Karkara	Herb	Flowers	Given in combination to improves male reproductive health
Syzygium aromaticum (L.) Merr. and L. M. Perry	Myrtaceae	Laung	Shrub	Floral buds	Improves male reproductive health
Tinospora cordifolia (Willd.) Hook and Thomson	Menispermaceae	Gulja, Giloy	Climber	Stem	Given in combination for conception
Withania somnifera (L.) Dunal	Solanaceae	Asgand, Punir	Shrub	Stem	Opening of closed fallopian tube
Zingiber officinale Roscoe	Zingiberaceae	Sounth	Shrub	Rhizome	Increase sperm count and male reproductive health

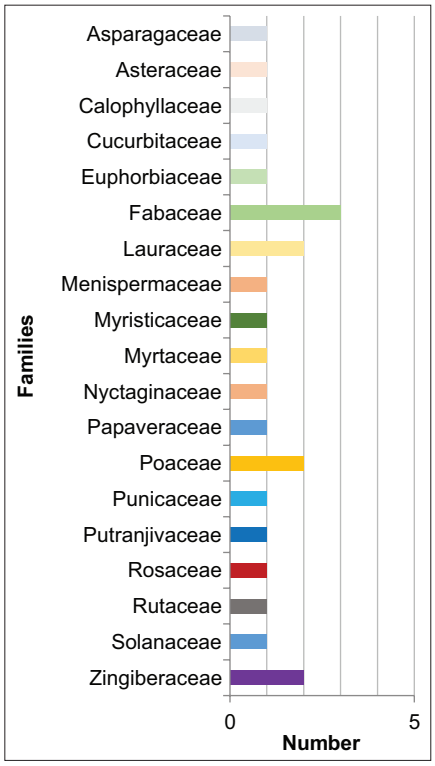

Figure 4: Diagram showing predominant families and species employed for medicinal purposes

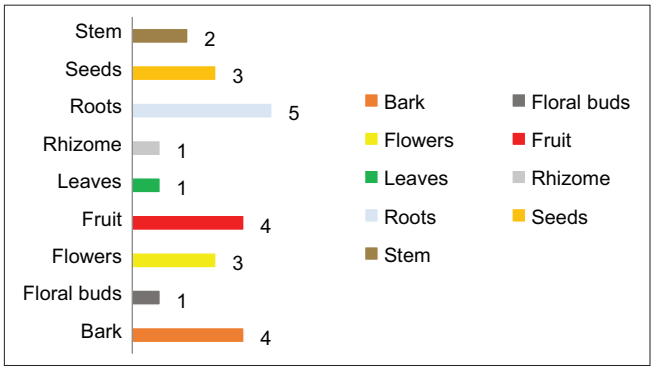

Figure 5: Bar diagram showing plant part utilized

The statistical analysis of the present study reveals the occurrence of 24 species belongs to 24 genera within 19 families and represents diverse life forms, that is, tree (11 spp.), shrubs (06), herbs (05), and climbers (02) [Table 1 and Figure 3]. Maximum number of medicinal plants was from the family Fabaceae (3 plants). It was followed by families Lauraceae, Poaceae, and Zingiberaceae with 2 spp. each. Rest of the fifteen families (Asparagaceae, Asteraceae, Calophyllaceae, Cucurbitaceae, Euphorbiaceae, Menspermaceae, Myristicaceae, Myrtaceae, Nyctaginaceae, Papaveraceae, Punicaceae, Putranjivaceae, Rosaceae, Rutaceae, and Solanaceae) contributed single species [Figure 4]. Different plant part (s), such as bark, floral buds, flowers, fruit, leaves, rhizome, roots, seeds, and stem [Figure 5] were used by the peoples for the treatment

of various ailments related to child birth, fertility and related disorders.

The finding on traditional knowledge in Una district was found just similar to the report of previous findings in different parts of country.[7,17,23-27] The present information clearly indicates the usefulness of indigenous knowledge awareness of the local people regarding the use of plant-based medicines for curing various ailments related to fertility and child birth. In addition to enhancing fertility naturally, herbs can help to maintain a healthy pregnancy and can also be used just prior to giving birth. Certain herbs are also recommended to be taken after childbirth which will tone the uterus and nourish the blood.

Conclusion

The present study shows that people of district Una dependent on traditional knowledge of plant for various ailments related to fertility and child birth. Total 24 plants species belongs to 19 families are utilized. The family Fabaceae leading with three species. Plant parts such as bark, floral buds, flowers, fruit, leaves, rhizome, roots, seeds, and stem were administered alone and in combination in different mode such as decoction, powder, or in crude form. It is further suggested that the information generated during the study regarding the medicinal plant need a thorough phytochemical investigation for novel drug discovery.

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