Identification of medical plants acting on reproductive system disorders: An ethnobotanical study in Urmia, Northwest of Iran

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ABSTRACT

Many different plants have been used in traditional medicine to regulate fertility or to treat infertility. In Urmia ethnobotany, different medicinal plants are also used to treat various diseases, so the aim of the present study was to identify and report the medicinal plants which are effective in treatment of reproductive system disorders in Urmia. Semi-structured interviews and questionnaires were carried out between 2013 June and 2014 February in Urmia. The results of this study indicated that a total of twenty seven native medicinal plants have been used in the treatment of dysmenorrhea, uterine and vaginitis infections, impotency, prostate and etc. Most of the drug information of the present study is new, and awareness of these applications can be helpful in discovery of new applications for industrial pharmacology.

Keywords: Fertility, Infertility, Medicinal plants, Urmia, Iran

INTRODUCTION

Fertility or the ability of having child is considered as success in reproduction and start of new life for couples. In contrast, infertility resulted from reproduction disorders which might be curable or not, can expose many couples with consequence problems unintentionally. In recent years a number of factors such as changes in the role of women in social activities, delay of marriage age, change in the age of having child, smoking, alcohol and coffee, genetic factors, pesticides, increased use of contraceptive pills, the rate of abortion and unfavorable economic situations have reduced fertility in industrialized countries [1][2]. Infertility is defined by the failure to achieve a clinical pregnancy after 12 months or more, with regular unprotected sexual intercourse (with no other reasons, such as breastfeeding or postpartum amenorrhoea). It is a global medical disorder affecting an average of 10 – 15 percent of human reproductive-age population [3]. Infertility is one of the crises of life that lead to psychological problems and serious stressful experience for patients [4].

Based on conducted studies on stressful life events, infertility has been ranked in the fourth place after death of mother, death of father and unfaithfulness of partner [5].
Primary dysmenorrhea is defined as cramping pain in the lower abdomen occurring just before or during menstruation, in the absence of any identifiable pelvic disease [6]. General prevalence rates are 50-90 percent and in Iran according to an epidemiologic study, the rate of this disease reported as high as 91 percent [7]. Primary dysmenorrhea is a very common problem in young women lower than 20 years old, while secondary dysmenorrhea which refers to painful menses resulting from pelvic pathology such as endometriosis is more common in the third and fourth decades of life [8][9].

Infections as well as anti-infectious agents can impair various important human functions, including reproduction [10, 11]. Infections are also of special relevance among causing agents of infertility. Infectious agents can affect the functionality of genital tract by directly disturb of different parts of genital tract system resulting in infertility or prevention of successful fertility. Nowadays, different estimates from different parts of the world exist about the role of infections in infertility. This is from 39 percent in developed countries to 85 percent in African countries [13]. In the female genital tract, infections can involve different parts of the cervix, uterus and fallopian tubes. Therefore, given the extent of different infectious agents and the varied mode of their functionality, it must be better that the anatomic site of infection investigated in the evaluation of infertility [14].

Genital tract infections are among the common women problems for which more than ten million women in America refer to medical centers annually [15]. According to the World Health Organization, the three factors including Candidiasis, Trichomoniasis, and Bacterial infections causes more than 90 percent of vaginal infections [16]. Other diseases of the reproductive system are the testes and prostate problems [17], Impotency [18][19], Endometriosis [20] and etc.

Infertility is one of the most complex issues in medicine. In each population approximately 13% of subjects are infertile which in many cases can be correctable [21]. The use of traditional medicine and medicinal plants has always been a source of efficient natural medicines for people [22-30]. Herbal medicines are available, have a variety of health benefits and public interest is growing toward their use [31-37].

There are several plants in traditional medicines which have positive effects on infertility [38]. In Urmia, a variety of medicinal plants are used for treatment of various diseases [39-42]. In this study, we tried to identify plants that are used in treatment of disorders and diseases of the reproductive system in Urmia.

Figure 1 The map of Iran
EXPERIMENTAL SECTION

This study was carried out using questionnaire and interviews from June 2013 to 2014 February in Urmia, Iran. Figure 1 presents the map of Iran. Urmia or Orumieh is one of the cities of West Azerbaijan province which is located in northwest of Iran (the red arrow shows Urmia).

Firstly, we provide the list of traditional healers in Urmia. Using interviews and the collection of herbarium specimens, native medicinal plants with positive effects on reproductive system disorders and diseases were selected. Questionnaires were distributed among herbalists of Urmia. The Ethnobotanical information of each plant as well as herbarium specimens were collected. Finally, the species of these plants were identified using different flora and sources such as Asadi [43], Ghahraman [44], Flora of Iranica [45], Flora of Turkey [46] and Flora of Iraq [47] with special attention to Dr Heydari Rikan. Finally, the data obtained from the questionnaires were entered in Excel 2010 and the frequency of family, used plant parts, traditional usage form and frequency of the treated diseases were analyzed.

RESULTS

After analyzing of the data collected from the questionnaires, a total of 27 native medicinal plants of Urmia were identified among 20 families. The results of this study showed that a total of 27 native medicinal plants were used in the treatment of dysmenorrhea, uterine and vaginitis infections, impotency, prostate, etc. Further details are given in Table 1.

![Figure 1. The frequency of plant families effective on reproductive system disorders](image-url)
Table 1. Complete information on Urmia medicinal plants effective in treatment of genitourinary system disorders

<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific name</th>
<th>Family</th>
<th>Persian name</th>
<th>Used parts</th>
<th>How to use</th>
<th>Therapeutic effect on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Achillea millefolium L.</td>
<td>Asteraeae</td>
<td>Bumaderan</td>
<td>Inflorescences</td>
<td>Boiled and brewed</td>
<td>Relieve menstrual cramps</td>
</tr>
<tr>
<td>2</td>
<td>Alhagi camelorum Fisch</td>
<td>Fabaceae</td>
<td>Kharshotor</td>
<td>Aerial part</td>
<td>Boiled and brewed</td>
<td>Uterine infections and vaginitis</td>
</tr>
<tr>
<td>3</td>
<td>Alyssum desertorum Stapf.</td>
<td>Brassicaceae</td>
<td>Ghodoumeh</td>
<td>Seed</td>
<td>Boiled, brewed and fumigation</td>
<td>Uterine infections and vaginitis</td>
</tr>
<tr>
<td>4</td>
<td>Artemisia sieberi Besser</td>
<td>Asteraeae</td>
<td>Dermaneh</td>
<td>Flowering branches</td>
<td>Boiled, brewed and fumigation</td>
<td>Pubic lice-killing</td>
</tr>
<tr>
<td>5</td>
<td>Bryonia dioica L.</td>
<td>Cucurbitaceae</td>
<td>Fashra</td>
<td>Root, powder and fruit</td>
<td>Boiled</td>
<td>Genital infection</td>
</tr>
<tr>
<td>6</td>
<td>Capsella bursa-pastoris (L.) Medik.</td>
<td>Brassicaceae</td>
<td>Kise keshish</td>
<td>Leave</td>
<td>Boiled</td>
<td>Genital tract infection</td>
</tr>
<tr>
<td>7</td>
<td>Centaurea behen L.</td>
<td>Asteraeae</td>
<td>Bahman Sephid</td>
<td>Root</td>
<td>Boiled and brewed</td>
<td>Eclipse women, impotency</td>
</tr>
<tr>
<td>8</td>
<td>Ceterach officinalis</td>
<td>Phillicineae</td>
<td>Sarakhs</td>
<td>Aerial parts</td>
<td>Poulilce</td>
<td>Pubic lice-killing</td>
</tr>
<tr>
<td>9</td>
<td>Colchicum kotschi Boiss.</td>
<td>Liliaeae</td>
<td>Gole hasrat</td>
<td>Flower</td>
<td>Poulilce</td>
<td>Pubic lice-killing</td>
</tr>
<tr>
<td>10</td>
<td>Dipsacus laciniatus L.</td>
<td>Dipsacaceae</td>
<td>Khaje bashi</td>
<td>Root, leave, seed</td>
<td>Boiled and pouline</td>
<td>Genital tract infection</td>
</tr>
<tr>
<td>11</td>
<td>Equisetum acvences L.</td>
<td>Equisetaceae</td>
<td>Dome ash</td>
<td>Aerial part</td>
<td>boiled</td>
<td>Effective on prostate</td>
</tr>
<tr>
<td>12</td>
<td>Fraxinus excitor L.</td>
<td>Oleaceae</td>
<td>Zaban gonjesik</td>
<td>Leave</td>
<td>Boiled</td>
<td>Infertility and ovarian cysts</td>
</tr>
<tr>
<td>13</td>
<td>Grammosciadium dauscoide DC.</td>
<td>Apiaceae</td>
<td>Shevid kohi</td>
<td>New leaf</td>
<td>Boiled</td>
<td>Dysmenorrhea</td>
</tr>
<tr>
<td>14</td>
<td>Lamium album L.</td>
<td>Lamiaceae</td>
<td>Gazane sephid</td>
<td>Flowering branches</td>
<td>Boiled</td>
<td>Vaginit</td>
</tr>
<tr>
<td>15</td>
<td>Lamium purpureum L.</td>
<td>Lamiaceae</td>
<td>Gazane germez</td>
<td>Flowering branches</td>
<td>Boiled</td>
<td>Prostate, vaginit</td>
</tr>
<tr>
<td>16</td>
<td>Linum usitatissimum L.</td>
<td>Lamiaceae</td>
<td>Katan</td>
<td>Seed</td>
<td>Boiled</td>
<td>Impotency</td>
</tr>
<tr>
<td>17</td>
<td>Onobrychis cornuta (L.) Desv.</td>
<td>Fabaceae</td>
<td>Esperes</td>
<td>Flowering branches</td>
<td>Boiled, brewed</td>
<td>Frankincense, Impotency</td>
</tr>
<tr>
<td>18</td>
<td>Onobrychis isetaphros Boiss.</td>
<td>Fabaceae</td>
<td>Esperes kohi</td>
<td>Flowering branches, seed</td>
<td>Boiled,</td>
<td>Prostate, vaginit</td>
</tr>
<tr>
<td>19</td>
<td>Polygonum hydropiper L.</td>
<td>Polygonaceae</td>
<td>Esperes</td>
<td>Flowering branches</td>
<td>Boiled</td>
<td>Regulate menstrual bleeding in women, impotency</td>
</tr>
<tr>
<td>20</td>
<td>Ritem rubes L.</td>
<td>Polygonaceae</td>
<td>Gazane abi</td>
<td>Stems and petioles</td>
<td>Boiled</td>
<td>Lowering of libido</td>
</tr>
<tr>
<td>21</td>
<td>Saitis triandra L.</td>
<td>Salicaceae</td>
<td>Rivas</td>
<td>Bark, leave</td>
<td>Boiled</td>
<td>Dysmenorrhea</td>
</tr>
<tr>
<td>22</td>
<td>Scrophularia kardice sibsp. glabra</td>
<td>Scropholariaceae</td>
<td>Bid badda</td>
<td>Aerial parts</td>
<td>Boiled</td>
<td>Antimicrobial genital</td>
</tr>
<tr>
<td>23</td>
<td>Stachys lavandulofolia Vahl.</td>
<td>Lamiaceae</td>
<td>Gole meymoni</td>
<td>Flowering branches</td>
<td>Boiled</td>
<td>Dysmenorrhea, genital housing</td>
</tr>
<tr>
<td>24</td>
<td>Teucrium orientale L.</td>
<td>Lamiaceae</td>
<td>Chaye alafi</td>
<td>Aerial part</td>
<td>Boiled</td>
<td>Gorgereftegi zanan</td>
</tr>
<tr>
<td>25</td>
<td>Tribulus terrestris L.</td>
<td>Zygophyllaceae</td>
<td>Maryam nolkodi</td>
<td>Aerial part</td>
<td>Boiled</td>
<td>Boost libido</td>
</tr>
<tr>
<td>26</td>
<td>Cinnamomum verum J.Presl</td>
<td>Lauraceae</td>
<td>Darchin</td>
<td>Leave</td>
<td>Boiled</td>
<td>Impotency</td>
</tr>
<tr>
<td>27</td>
<td>Ziziphora tenauior L.</td>
<td>Lamiaceae</td>
<td>Kakoti</td>
<td>Inflorescences</td>
<td>Boiled</td>
<td>Impotency</td>
</tr>
</tbody>
</table>
In this study for all 27 plants with positive effect on reproductive system, the analytical data are presented in figure 1-3.

Based on the results, Laminaceae family dedicated the most frequency among other plant families.

According to the results of statical analyses, the frequency of leave (23%) was higher than other parts in the treatment of disorders and diseases of the reproductive system.
The boiled form with 66% had the highest frequency among the other used forms of medicinal plants in order to treat reproductive system disorders.

DISCUSSION

Due to specific climatic conditions and geographical location, West Azerbaijan is suitable place for growing of a variety of plants. Nowadays, of about 8000 plant species which have been identified in our country, more than 1000 species are allocated to this province.

The results of the present study showed that a total of 27 native medicinal plants from 20 families in Urmia were effective in treatment of reproductive system disorders that herbalists in Urmia have used them for treatment of reproductive biology disorders.

In ethnobotany of Kerman Province located in the East of Iran, the Yarrow (Achillea eriophora) is used to treat menstrual cramping. Also, log (Anethum graveolens) is used to treat of joint pain and children cramping, Sagebrush (Artemisia aucheri) for treatment of abdominal pain, White nettle (Lamium album) for the treatment of rheumatoid, Rhubarb (Rheum ribes) to strengthen the liver and stomach, a species of monkey flower (Scrophularia scopolii) for the treatment of lumbar disc and respiratory and Thistle (Tribulus terrestris) is used to treat of external inflammation [48].

In Arasbaran located in the north of Iran, the plant of Achillea millefolium L. is used as anti-cancer, hypotensive, disinfectant and anti-gastritis. Horsetail (Equisetum arvense) is used as antidepressants, anti-inflammatory, antiperspirant, wound healing and cure for kidney diseases and diabetes. White nettle (Lamium album L) is used as anti-inflammatory, diuretic, fun, healer and elimination of discharge femininity [49].

In Sistan and Baluchistan province located in the South East of Iran, Madder (Rubia tinctorum L.) is used as a laxative, relieve constipation, treatment of kidney stones. In addition, the devil (Tribulus terrestris) is used for tonic and bitter tonic, antipyretic, urinary tract inflammation [50].

In Shiraz located in the south of Iran, Yarrow (Achillea eriophora DC.) is used to remove hemorrhoids, diarrhea, skin inflammation, blood clotting, anti-arthritic and antipyretic. White Flax (Linum album Ky. Ex Boiss.) is used for treatment of Cancer, Gastroenteritis, constipation, cough, diabetes and menstrual pain [51].

In Kazeroon (south of Iran) the log (Anethum graveolens L.) is used as an hypolipidecic agent, anticonvulsant and anti-vomiting. Also, Yarrow (Achillea tenufolia Lam.) has been used to strengthen the nerves and heart. Shepherd's Purse (Capsella bursa-pastoris (L.)) is used as astringent and is also used to stop bleeding stomach. Fountain grass (Nasturtium officinale (L.) R. Br.) is used to Hungarian administrative expulsion or Treatment of Urology stones, Horsetail (Equisetum arvense L) to stops nosebleeds, Ash (Fraxinus angustifolia) as antiparasitic, housing and photodermatitis and the devil (Tribulus terrestris L.) is used for treatment of kidney stones [52].

In Kashan (center of Iran), traditional healers have used yarrow (Achillea wilhelmsii C. Koch) to relieve pain, the kind of alyssum (Alyssum bracteatum Boiss) for colds, a kind of camel's thorn (Alhagi persarum Boiss. & Buhse.) as body cooling [53].

In Lorestan province located in the South West of Iran, Matricaria aurea is used to treat female infections, the Eremostachys laevigata & Eremostachys pulvinata is used for treatment of genital infection, Faba vulgaris is used to treat women mastitis, Ulmus minor is used in the treatment of infertility [54].

Comparing ethnobotany of different parts of Iran showed that some medicinal plants investigated in this study have new therapeutic effects which are reported for the first time in this study, although, some presented similar effect to those of other studies. Still, in many parts of our country there are some unknown species of medicinal plants that have been used for the treatment of indigenous people diseases. Most of the drug information presented in the current study is new, and awareness of these applications can be helpful in discovery of new applications for industrial pharmacology. In other words, our ethnobotany study in comparison with those of other parts showed that Iranian traditional medicine used different medicinal plants for different therapeutic effects.
Most of the plans introduced in this review paper have phenolic compounds and antioxidant activities\textsuperscript{[55-64]}. Some reproductive system disorders cause oxidative stress\textsuperscript{[65]}. Oxidative stress other than in reproductive disorders, is also implicated in a wide variety of diseases including infectious conditions\textsuperscript{[66-68]}, as well as kidney\textsuperscript{[69,70]} or liver\textsuperscript{[71][72]} complications. These conditions involve many changes, including alterations in redox state\textsuperscript{[73][74]}. Medicinal plants with antioxidant activity have been shown to inhibit these conditions. These agents are also effective in inhibition of toxic agents induced complications\textsuperscript{[75]}. Therefore, they may act, at least in partial, by counteracting oxidative stress induced reproductive disorders.

Because of high prevalence of reproductive system disorders in various populations, attempt to produce new natural medicines from medical plants has attracted many interests\textsuperscript{[76-78]}. Currently, such researches have been the subject of extensive studies worldwide\textsuperscript{[79-102]}.

**CONCLUSION**

Having the proper climatic conditions, Ghasemloo Forestry in Urmia, is a rich source of plant species. So, much knowledge in field of botany can be seen in this area. Therefore, it seems that local residents in Urmia by utilizing the experience of his predecessors use medicinal herbs in the treatment of disorders and diseases. The documenting of this valuable drug information is of crucial important, thereby providing traditional drug information for the modern science of pharmacology. Most of the drug information of the present study is new, and awareness of these applications can be helpful in discovery of new applications for industrial pharmacology. It is suggested that the effects of the medical herbs investigated in this study apply in clinical trials in order to produce new natural drugs if they show beneficial health effects.

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