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## Traditional plants used for the treatment of gynaecological disorders in Vedaranyam taluk, South India - An ethnomedicinal survey



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### ABSTRACT

Gynaecological disorder is one of the most severe conditions under reproductive health. So we investigate and collect information from traditional practitioners on the use of medicinal plants for treatment of Gynaecological disorder in Vedaranyam taluk, Nagappattinam district of South India. The field study was carried out for a period of January 2014–January 2015 in Vedaranyam taluk, Nagappattinam district of South India. This is the first traditional medicine study in which statistical calculations about plants are done by RFC, CI, UV and ICF in the study area. The ethnomedicinal information was collected through interviews, informal meetings, open and group discussions and overt observations with semi-structured questionnaires among traditional practitioners. A total of 66 species of plants distributed in 62 genera belonging to 44 families were identified as commonly used ethno medicinal plants by traditional practitioners in Vedaranyam taluk for the treatment of 36 ailments based on the reproductive systems treated. Leaves were the most frequently used plant parts and most of the medicines were prepared in the form of paste and administered orally. We know the most important species according to their use value such as *Moringa oleifera*, *Smailax zeylanica* and *Achyranthes aspera* were recorded. The present study, we have highlighted some claims which are high use in the study area. Further pharmacological studies of these plants may provide some important drugs for the treatment of common gynaecological disorders.

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### 1. Introduction

Gynaecology or gynecology is the medical practice dealing with the health of the female reproductive system (uterus, vagina and ovaries). Gynaecology is an important branch which deals with the treatment of ailments among rural women for example abortion, menstrual trouble, menopause syndrome, morning sickness, leucorrhoea, anti-fertility, delivery problem, etc.<sup>1</sup> Socio economic conditions force many women's seek abortion. In countries where abortion is illegal or where the health system can't provide sufficient care, women are left with option of inducing abortion themselves. In India, Indian phenol code, which was enacted in 1816 and was written in accordance with British law at the time of creation, declared induced abortion as illegal. Induced abortion was

defined as purposely causing miscarriage.<sup>2</sup>

According to WHO<sup>3</sup> 'The health care of women is Crucial'. Women who live in hamlets economically and educationally very, very poor. Generally pregnant women of rural areas prefer a skilled village midwife to gynaecologist for delivery. It is not possible for them to go to the healthcare and multispecialty centers owing to distance and inadequacy of money. Traditional birth attendants (TBA) provide the majority of primary maternity care in many developing countries. In India, TBA have provide basic healthcare, support and advice during and after pregnancy and child birth, based primary on experience and knowledge acquired infirmly through the tradition and practice of the community where they originated. They usually work in rural, remote and other medically underserved areas.

Approximately 80% of world population depends on traditional herbal medicine for primary healthcare as plant and plant based medication in the base of many of the today's pharmaceutical drugs used for various ailments.<sup>4</sup> In India almost 95% of medications are plant based formulations from the traditional system of Unani, Ayurveda, Homeopathy and Siddha and their associate material

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largely depended on wild harvested plants.<sup>5</sup>

Herbal medication hold highly reputational position in the developing countries like India and China becoming popular among people of both urban and rural areas to their safety, efficacy and affordability. Almost 8,000 plant species are registered for their ethnomedicinal importance<sup>6</sup> and traditional knowledge based formulations or indigenous traditional medicine has played an elementary role in the innovation of novel healthcare products from plants.<sup>7</sup>

Many ethnobotanical studies have been carried out on the medicinal use of herbal plants but very few quantitative studies have been performed on the use of traditional remedies for gynaecological care. Fortunately, the tradition of using traditional remedies to treat female healthcare problem is still very much alive. However these traditional remedies have not been thoroughly documented. The creation of nuclear families where grand mothers are absent, migration to cities easy availability of synthetic drugs and access to primary health centre's are some of the reasons for the less of traditional knowledge about traditional remedies. In this study, we have documented the traditional knowledge on plants used for treating gynaecological disorders.

## 2. Materials and methods

### 2.1. Selection of traditional practitioners

The population of the Vedaranyam (Taluk), Nagapattinam district is around 8 sites in our study total of 2, 15,653 (Males-1, 07, 007; Females-1, 08, 646) peoples were lived ([http://en.wikipedia.org/wiki/Vedaranyam\\_taluk](http://en.wikipedia.org/wiki/Vedaranyam_taluk)). The informants or traditional practitioners were selected based on their knowledge of medicinal plants in the study area. The practitioners who had been practicing for more than 5 years were included in the survey. In the first visit, the purpose and nature of the project were explained to each practitioner in a simple language, to get prior informant consent. After establishing a clear consent from them, formal interviews were conducted from the second visit onwards. In this study, 120 traditional healer medical practitioners were included and their knowledge on medicinal plants was gathered. The interviews were conducted in the local language 'Tamil' and the documentation of the data in the field was also done in the local language. Successive free listing was the method adopted for the interview.<sup>8</sup> The interview consisted of two parts. The first part dealt with the demographic profile of the informants which included the name, gender, age, professional experience, educational status and occupation (Appendix A). The second part dealt with their medicinal plant knowledge (Appendix B). The informants were asked to describe the medicines that were given by them with their mode of usage. The details regarding the parts used, mode of preparing the medicine and solvent used for administration in this part. Furthermore, the informants were asked to describe the symptomatology of illnesses.

### 2.2. Investigation sites

The study area was investigated to get information from local traditional practitioners having practical knowledge of medicinal plants were interviewed in 8 villages of Kallimedu, Kodia kadu, Kuravap palam, Maruthur south, Nakudaiyan, Panjanadhikulam east, Periakuthakai and Putpavanam, Vedaranyam (taluk), Nagapattinam (dt), Tamil Nadu, India (Fig. 1). The field surveys were conducted between January 2014 and January 2015 in Vedaranyam taluk of Nagapattinam district. A total of 365 field days was spent together the data. Methods of selecting informants depended upon the distribution of local people having sound knowledge. They

were requested to collect specimens of the plants they know or to show the plant species on site. These informants were traditional practitioners themselves or had tradition of healing in their families and had knowledge of the medicinal use of the plants. The wealth of medicinal plant knowledge among the people of this district is based on hundreds of years of beliefs and observations.

### 2.3. Preservation of plant specimens

Standard method was followed with record to collection of plant materials, drying, mounting, preparation and preservation of plant specimens.<sup>9</sup> Voucher specimens of medicinal plants in triplicate were collected, prepared and identified. Plants with their correct nomenclature were arranged alphabetically by family name, vernacular name, ethno medicinal uses and other applications. The identification and nomenclature of the listed plants were based on the Flora of Presidency of Madras<sup>10</sup> and the Flora of Tamil Nadu Carnatic.<sup>11</sup> They were later verified at Botanical Survey of India, Southern Circle, Coimbatore, India. All the preserved specimens were deposited at the Herbarium of A.V.V.M.S.P. College (Pushpam Herbarium Cabinet (PHC), Poondi.

### 2.4. Quantitative analysis

#### 2.4.1. Relative frequency citation (RFC)

This index used here is the relative frequency of citation (RFC). This index is obtained by dividing the number of informants mentioning a useful species (FC or frequency of citation), by the total number of informants in the survey (N). RFC value varies from 0 (when nobody refers to a plant as a useful one), to 1 (when all the informants mentioning it as useful).<sup>12</sup> RFC index, which does not consider the use-category (UR or use-report is a single record for use of a plant mentioned by an individual) and RFC calculated by the following formula:

$$RFC_s = \frac{FC_s}{N} = \frac{\sum_{i=1}^{iN} UR_i}{N}$$

#### 2.4.2. Cultural importance index (CI)

The second approach used in our study is the cultural importance index (CI). This index is calculated by the sum of the proportion of informants mentioning each species use (i.e. the sum of the number of participants who mention the use of each species divided by the total number of informants (N)). This index is calculated by the following formula:

$$CI_i = \sum_{u=1}^{uNC} \sum_{i=1}^{iN} UR_{ui} / N$$

This index takes into account the spread of the use (number of informants) for each species along with its versatility, i.e. the diversity of its applications.<sup>12</sup>

#### 2.4.3. Use value (UV)

The Use Value (UV) demonstrates the relative importance of plants known locally. It was calculated using the following formula.<sup>13</sup>

$$UV = \sum U_i / N$$

where  $U_i$  is the number of uses mentioned by each informant for a given species and N is the total number of informants.

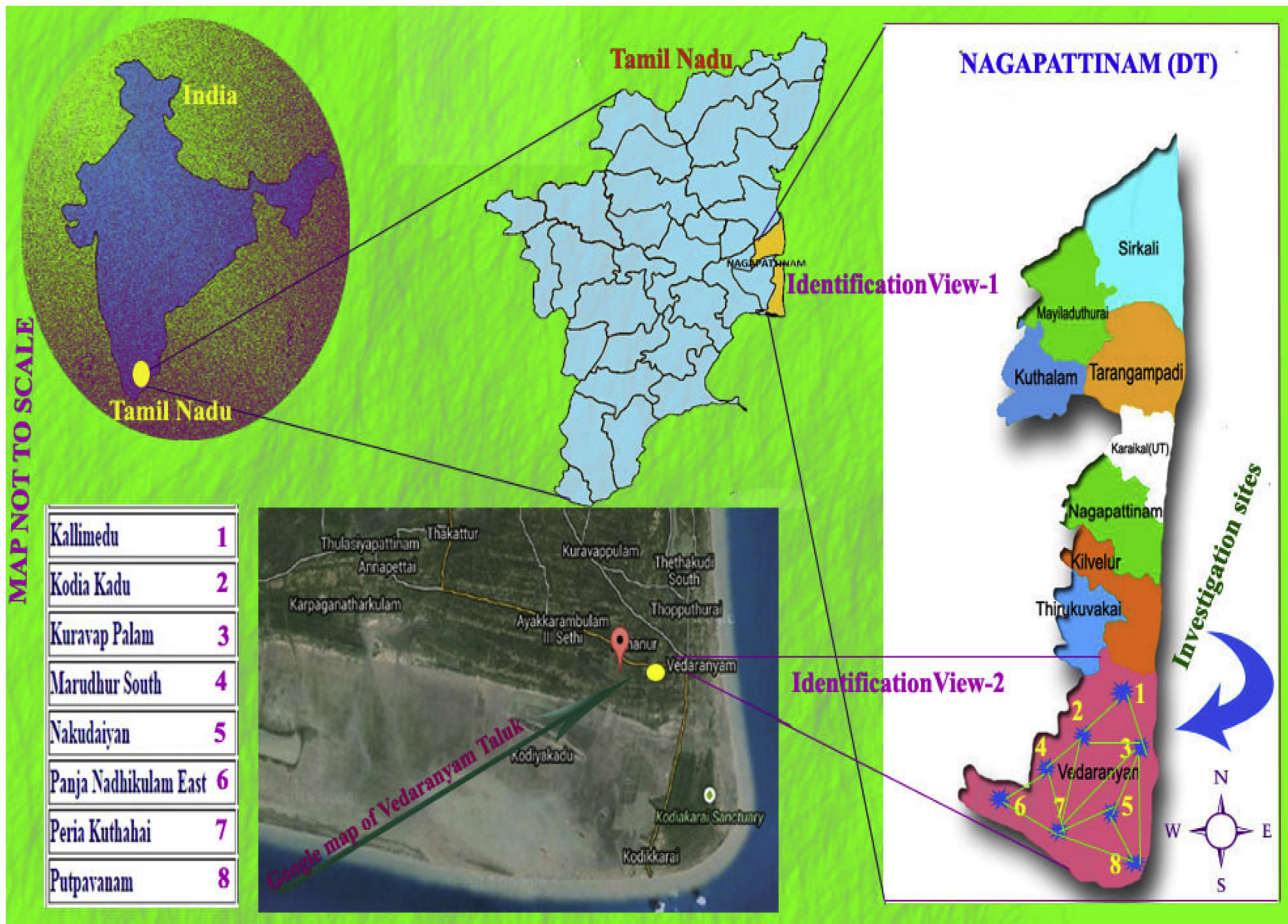


Fig. 1. Investigation sites.

2.4.4. Informant consensus factor

The informant consensus factor (ICF) was used to see if there was agreement in the use of plants in the ailment categories between the plant users in the study area. The Fic was calculated using the following formula<sup>14</sup>

$$ICF = (N_{ur} - N_t) / (N_{ur} - 1)$$

where Nur refers to the number of use-reports for a particular ailment category and Nt refers to the number of taxa used for a particular ailment category by all informants. The product of this Factor ranges from 0 to 1. A high value (close to 1.0) indicates that relatively few taxa are used by a large proportion of the informants. A low value indicates that the informants disagree on the taxa to be used in the treatment within a category of illness.

3. Results

Face to face interviews were conducted for resolving and registering demographic characteristics of respondents. Among the practitioners the age groups of 30–83 was very high compared to other groups. Around 6.66% of practitioners were below thirty years old. There was no equal dividends as for as male-female ratio concern (Table 1). The ethnobotanical survey permitted the sampling of 66 plants species, belonging to 62 genera and 44 families were recorded (Table 2). The most represented family was Fabaceae has the high number of species (5) followed by Malvaceae and Cucurbitaceae with each four species, Lamiaceae, Euphorbiaceae and

Moraceae with three species each (Table 3). In the current survey, 37% of the reported species are herb. Other highly reported species are tree (28%), climber (21%) and shrub (14%) (Fig. 2). Plant parts

Table 1 Demographic profile of the informants included in the survey (N = 120).

| Demographic features  | Number of people | Percent (%) |
|-----------------------|------------------|-------------|
| <b>Age</b>            |                  |             |
| 30 years              | 8                | 6.66%       |
| 31–40                 | 20               | 16.66%      |
| 51–60                 | 30               | 25.00%      |
| 61–70                 | 35               | 29.16%      |
| 71–80                 | 16               | 13.33%      |
| Above-81              | 11               | 9.16%       |
| <b>Gender</b>         |                  |             |
| Men                   | 68               | 56.66%      |
| Women                 | 52               | 43.34%      |
| <b>Education</b>      |                  |             |
| Uneducated            | 47               | 39.16%      |
| Primary school        | 13               | 10.83%      |
| Secondary school      | 24               | 20.00%      |
| High school           | 11               | 9.16%       |
| Degree                | 16               | 13.33%      |
| Diploma               | 9                | 7.50%       |
| <b>Occupation</b>     |                  |             |
| Self employs          | 35               | 29.16%      |
| Government employs    | 17               | 14.16%      |
| <b>Cattle drovers</b> |                  |             |
| a. Goat               | 43               | 35.83%      |
| b. Cow                | 15               | 12.50%      |
| c. Pig                | 10               | 8.33%       |

**Table 2**

Medicinal plants treated in traditional healers of rural community in Vedaranyam (Taluk) to treat gynaecological disorders.

| No. | Botanical name, family & voucher no.                      | Vernacular name           | Life form | Parts used            | IP  | Illness treated with no. of IR in each illness   | Total no. of UR | RFC   | CI Value | Use Value | Preparations                     | Solvents used for administration  | Reported Literatures           |
|-----|---|---------------------------|-----------|-----------------------|-----|--|-----------------|-------|----------|-----------|----------------------------------|---|--------------------------------|
| 1.  | <i>Abrus precatorius</i> L. (Fabaceae) PHC-1305           | Kundumani (கண்டும்ணி)     | Climber   | Seed                  | 50  | Painful bleeding (IR:36)   | 36              | 0.416 | 0.720    | 0.300     | Powder                           | Mixed with Hot water, then taken orally during pain.  | <sup>34</sup>                  |
| 2.  | <i>Abutilon indicum</i> , G. Don. (Malvaceae) PHC-1321    | Thuththi (துத்தி)         | Herb      | Seed                  | 80  | <b>Amenorrhoea:</b> Absence of menstrual period during the reproduction days (IR:67)   | 67              | 0.666 | 0.837    | 0.558     | Powder                           | Dried seed powder mixed with ordinary water, then taken orally on every morning for 3 days.   | Not reported                   |
| 3.  | <i>Acacia farnesiana</i> L. (Mimosaceae) PHC-1340         | Kasthurivel (கச்சுறிவேல்) | Tree      | Bark                  | 94  | <b>Leucorrhoea:</b> White discharge from the reproductive organ (IR:87)<br><b>Menorrhagia:</b> Excessive level of blood flow with long days (IR:47)                                    | 134             | 0.783 | 1.425    | 1.116     | Powder                           | Mixed with Hot water then taken orally  | <sup>34</sup>                  |
| 4.  | <i>Achyranthes aspera</i> L. (Amaranthaceae) PHC-1354     | Nayuruvi (நாயுருவி)       | Herb      | Root<br>Leaves        | 92  | <b>Easy delivery:</b> Less pain delivery during delivery time (IR:92)<br><b>Amenorrhoea:</b> Absence of menstrual period (IR:91)<br><b>Dysmenorrhoea:</b> Painful menstruation (IR:63) | 246             | 0.766 | 2.673    | 2.050     | Powder<br>Decoction<br>Decoction | Mixed with water, then taken orally before delivery. Dried leaves boiled with water, then filter the decoction and taken orally on early morning for 3 days. Same as above preparation method. But, it is taken during suffer from the painful menstruation | <sup>37</sup>                  |
| 5.  | <i>Aloe vera</i> L. (Liliaceae) PHC-1311                  | Kaththalai (கத்தலை)       | Herb      | Leaves                | 83  | <b>Uterine disorders:</b> Irregular periods and excessive pain during menstrual periods (IR:73)<br>To control over bleeding of blood after delivery- (IR:53)                           | 126             | 0.691 | 1.518    | 1.050     | Juice<br>Juice                   | Mixed with 12 h rice soaked water, then taken orally on 3–5 days in the early morning. Taken fresh juice at the time of bleedings   | <sup>38</sup><br><sup>39</sup> |
| 6.  | <i>Adathoda vasica</i> . Nees. (Acanthaceae) PHC-1360     | Aadathodai (ஆடாதோடை)      | Shrub     | Root                  | 103 | <b>Easy delivery:</b> Less pain delivery during childbirth (IR:81)   | 81              | 0.858 | 0.786    | 0.675     | Decoction                        | Dried leaves boiled with water, then filter the decoction and taken orally  | <sup>23</sup>                  |
| 7.  | <i>Annona squamosa</i> L. (Annonaceae) PHC-1353           | Seettha (சீத்தா)          | Tree      | Root                  | 64  | <b>Abortion:</b> Avoid unnecessary pregnancy without any effects (IR:36)   | 36              | 0.533 | 0.562    | 0.300     | Powder                           | Mixed with water, then taken orally during pregnancy  | <sup>34</sup>                  |
| 8.  | <i>Aristolochia indica</i> L. (Aristolochiaceae) PHC-1366 | Eeswaramuli (ஈஸ்வரமுலி)   | Climber   | Root<br>Root          | 89  | <b>Menstrual disorders:</b> Irregular menstrual periods (IR:83)<br><b>Over bleeding:</b> Excessive flow of blood during menstrual periods (IR:49)                                      | 132             | 0.741 | 1.483    | 1.100     | Powder<br>Decoction              | Mixed with ordinary water, then taken orally in the daily early morning 5–7 days<br>Dried root boiled with water, then filter the decoction and taken orally  | <sup>34</sup>                  |
| 9.  | <i>Asparagus racemosus</i> Wild. (Asparagaceae) PHC-1330  | Ammalkodi (அம்மாஸ்கொடி)   | Climber   | Tuber<br>Root<br>Stem | 112 | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk on the time of   | 217             | 0.933 | 1.937    | 1.808     | Powder<br>Paste<br>Decoction     | Mixed with honey in paste formation, then taken orally for 5–7 days.<br>Dried leaves boiled with  | <sup>34</sup>                  |

(continued on next page)

Table 2 (continued)

| No. | Botanical name, family & voucher no.                                    | Vernacular name              | Life form | Parts used                 | IP  | Illness treated with no. of IR in each illness   | Total no. of UR | RFC   | CI Value | Use Value | Preparations       | Solvents used for administration  | Reported Literatures           |
|-----|---|------------------------------|-----------|----------------------------|-----|--|-----------------|-------|----------|-----------|--------------------|---|--------------------------------|
|     |   |                              |           |                            |     | feeding to the child (IR:72)<br><b>Uterine disorders:</b> To Cure hormone imbalanced irregular menstrual disorders (IR:42)<br><b>Excess Bleeding:</b> To control excessive flow of blood during menstrual periods (IR:103) |                 |       |          |           |                    | water, then filter the decoction and mixed ghee. Later, this product taken orally for 28 days daily. Dried leaves boiled with water, then filter the decoction and taken orally.  |                                |
| 10. | <i>Azadirachta indica</i> A.Juss., (Meliaceae) PHC-1306                 | Vaambu (வேம்பு)              | Tree      | Fruit<br>Bark              |     | To control irregular menstrual cycle- (IR:117)<br><b>Leucorrhoea:</b> Due to the estrogen imbalance the reproductive organ is produced thick white and yellowish discharge (IR: 67)  | 184             | 0.991 | 1.546    | 0.975     | Paste<br>Decoction | Powdered fruit mixed with water, then stirred well until change paste and taken orally<br>Dried bark is boiled in water until extract decoction well, then the honey mixed with decoction and drink daily morning 28 days | <sup>34</sup><br><sup>38</sup> |
| 11. | <i>Benincasa cerifera</i> , L. (Cucurbitaceae) PHC-1341                 | Poosani (பூசணி)              | Climber   | Fruit                      | 77  | <b>Vulvodynia:</b> To control the vulval burning region and soreness (IR: 59)  | 59              | 0.641 | 0.766    | 0.491     | Juice              | Fruit juice is mixed with honey, then drink daily morning   | Not Reported                   |
| 12. | <i>Borassus flabellifer</i> L. (Arecaceae) PHC-1322                     | Nungu (நூங்கு)               | Tree      | Male Inflorescence<br>Root | 106 | <b>Contraceptive:</b> To avoid the unnecessary pregnancy (IR:102)<br>To excessive or prolonged menstrual cycle-(IR:117)  | 219             | 0.883 | 2.066    | 1.825     | Powder<br>Paste    | Fine powdered flower mixed with milk, then drink empty stomach<br>Fresh root grinds paste form, then taken orally   | <sup>34</sup>                  |
| 13. | <i>Boerhavia diffusa</i> . L. (Nyctaginaceae) PHC-1320                  | Mookarattai (மூக்கரட்டை)     | Shrub     | Whole plant<br>Root        | 58  | <b>Leucorrhoea:</b> White discharge from the female reproductive organs (IR:52)<br>To hasten the delivery -(IR:18)   | 70              | 0.483 | 1.206    | 0.583     | Decoction<br>Paste | Dried leaves boiled with water, then filter the decoction for a drink during reproductive problem<br>Fresh root grinds to paste, then eaten   | <sup>34</sup>                  |
| 14. | <i>Calotropis gigantea</i> (L.) R. Br. ex Schult (Apocynaceae) PHC-1312 | Erukku (எருக்கு)             | Shrub     | Root<br>Latex              | 75  | To avoid Irregular menstruation (IR:72)<br>To induce uterine contraction during child birth (IR:43)  | 115             | 0.625 | 1.533    | 0.958     | Decoction<br>Raw   | Dried root is boiled well until to extract the decoction, then taken orally<br>Latex mixed with coconut oil, then apply topically   | <sup>34</sup>                  |
| 15. | <i>Cardiospermum halicacabum</i> . L. (Sapindaceae) PHC-1331            | Mudakkatthaan (முடக்கத்தான்) | Climber   | Leaves                     | 64  | To avoid high risk delivery pain (IR:63)   | 63              | 0.533 | 0.984    | 0.525     | Decoction          | Dried bark is boiled in water until extract decoction well, then drink  | <sup>23</sup>                  |
| 16. | <i>Catharanthus roseus</i> (L.) G.Don. (Apocynaceae) PHC-1323           | Nithyakalyani (நித்யகல்யாணி) | Herb      | Leaves                     | 99  | <b>Leucorrhoea:</b> White discharge from the female reproductive organs (IR:81)<br><b>Menorrhagia:</b> Excessive level of blood flow with long days (IR:92)  | 173             | 0.825 | 1.747    | 1.441     | Juice              | Fresh leaves crushed until extracts juice, then mixed with honey and drink  | <sup>34</sup>                  |

|     |   |                             |         |        |    |   |     |       |       |       |             |   |    |
|-----|---|-----------------------------|---------|--------|----|---|-----|-------|-------|-------|-------------|---|----|
| 17. | <i>Ceiba pentandra</i> (L.) Gaertn. (Malvaceae) PHC-1355        | Ilavam panju (இலவம் பஞ்சு)  | Tree    | Root   | 63 | <b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:61)  | 61  | 0.525 | 0.968 | 0.508 | Paste       | Fresh root grinds paste and add sugar, then taken orally  | 34 |
| 18. | <i>Centella asiatica</i> (L.) Urban. (Apiaceae) PHC-1361        | Vallarai (வல்லாரை)          | Shrub   | Leaves | 77 | Irregular menstrual cycle (IR:74)   | 74  | 0.641 | 0.961 | 0.641 | Juice       | Hand amount of leaves grinds well and mixed water until change like juice, then drink                                   | 34 |
| 19. | <i>Cissus quadrangularis</i> L. (Vitaceae) PHC-1309             | Pirandai (பிரண்டை)          | Climber | Stem   | 78 | Irregular menstruation (IR:76)  | 76  | 0.650 | 0.974 | 0.633 | Juice       | Fresh stem juice drinks daily 7–12 days morning empty stomach   | 34 |
| 20. | <i>Cleome viscosa</i> L. (Capparidaceae) PHC-1351               | Naaivaalai (நாய்வேளை)       | Herb    | Leaves | 54 | To control over bleeding during menstrual period (IR:49)  | 49  | 0.450 | 0.907 | 0.408 | Paste       | Hand amount of leaves grinds to make a paste and taken orally   | 23 |
| 21. | <i>Clitoria ternatea</i> L. (Fabaceae) PHC-1342                 | Sangupushpam (சங்குபூஷ்பம்) | Climber | Root   | 97 | <b>Leucorrhoea:</b> White discharge from the female reproductive organs (IR:93)<br><b>Urinal disorder:</b> Increase the urination (IR:73)                         | 166 | 0.808 | 1.711 | 1.383 | Paste       | 4-5 healthy fresh leaves crushed and taken juice orally   | 34 |
| 22. | <i>Coccinia indica</i> L. (voigt) (Cucurbitaceae) PHC-1313      | Kovai (கோவை)                | Climber | Leaves | 88 | Urinary obstruction (IR: 85)  | 85  | 0.733 | 0.966 | 0.708 | Juice       | Enough amount of leaves grinds to paste, then taken orally  | 23 |
| 23. | <i>Commelina bengalensis</i> L. (Commelinaceae) PHC-1339        | Kana vaalai (கன வாழை)       | Herb    | Leaves | 27 | Control the painful urination and white discharge (IR:23)   | 23  | 0.225 | 0.851 | 0.191 | Paste       | 7-8 dried leaves taken into the pot and burned, then respiratory through nasal  | 23 |
| 24. | <i>Convolvulus gemellus</i> L. (Convolvulaceae) PHC-1324        | Thaalikkeerai (தாளிக்கீரை)  | Climber | Leaves | 39 | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk on the time of feeding to the child (IR: 37)<br>Urinary tract infection (IR:68) | 105 | 0.325 | 1.179 | 0.875 | Fumes Paste | Hand amount of seed cotyledons juice with milk combination taken orally<br>Fresh leaves grinds paste, then taken orally | 23 |
| 25. | <i>Cucurbita maxima</i> L. (Cucurbitaceae) PHC-1310             | Parangi (பரங்கி)            | Climber | Seed   | 27 | Overactive bladder during the pregnancy period (IR:23)  | 23  | 0.225 | 0.851 | 0.191 | Juice       | Dried stem powder mixed with honey before treatment, then taken orally  | 23 |
| 26. | <i>Cyclea peltata</i> Arn. ex wight (Menispermaceae) PHC-1307   | Seenthilkodi (சீந்தில்கொடி) | Herb    | Stem   | 77 | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk at the time of feeding to the child (IR:67)                                     | 67  | 0.641 | 0.870 | 0.558 | Powder      | Hand amount of fresh leaves grinds with water and making juice, then taken orally                                       | 23 |
| 27. | <i>Cynodon dactylon</i> , Pers., (Poaceae) PHC-1332             | Arugam pull (அருகம் புல்)   | Herb    | Leaves | 56 | Irregular menstrual cycle (IR:114)  | 114 | 0.466 | 2.035 | 0.950 | Juice       | Dried 70gm of fruit powder mixed with honey, then taken orally  | 38 |
| 28. | <i>Curculigo orchioides</i> S. Gaerth (Amaryllidaceae) PHC-1365 | Nilapanai (நிலப்பனை)        | Herb    | Tuber  | 93 | Promoting sexual desire (IR:81)   | 81  | 0.775 | 0.870 | 1.033 | Powder      | 50gm of healthy fresh fruit taken orally  | 37 |
| 29. | <i>Emblica officinalis</i> Gaertn.(T)                           | Nelli (நெல்லி)              | Tree    | Fruit  | 76 | <b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:75)  | 75  | 0.633 | 0.986 | 0.625 | Raw         | 70gm of dried leaf powder mixed with Ghee, then taken orally  | 34 |

(continued on next page)

Table 2 (continued)

| No. | Botanical name, family & voucher no.  | Vernacular name                   | Life form | Parts used           | IP | Illness treated with no. of IR in each illness   | Total no. of UR | RFC   | CI Value | Use Value | Preparations                | Solvents used for administration   | Reported Literatures |
|-----|---|-----------------------------------|-----------|----------------------|----|--|-----------------|-------|----------|-----------|-----------------------------|--|----------------------|
| 30. | (Phyllanthaceae)<br>PHC-1343<br><i>Euphorbia heterophylla</i> , L.<br>(Euphorbiaceae)<br>PHC-1356 | Paal perukki<br>(பால் பெருக்கி)   | Herb      | Leaves               | 86 | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk on the time of feeding to the child (IR:81)  | 81              | 0.716 | 0.941    | 0.675     | Paste                       | 75gm of dried powder is boiled with water until the extraction of decoction. Then the decoction mixed with Cow milk and taken orally   | 23                   |
| 31. | <i>Euphorbia hirta</i> L.<br>(Euphorbiaceae)<br>PHC-1350  | Chithrapaladai<br>(சித்ரபலாடை)    | Herb      | Leaves               | 44 | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk on the time of feeding to the child (IR:32)  | 32              | 0.366 | 0.727    | 0.266     | Decoction                   | 4-5 healthy, fresh leaves crushed and collected the juice, then drink  | 40                   |
| 32. | <i>Feronia elephantum</i> ,<br>Corr. (Rutaceae)<br>PHC-1325                                       | Vilaa (விலா)                      | Tree      | Latex                | 72 | <b>Menorrhagia:</b> Excessive level of blood flow with long days and<br><b>Leucorrhoea:</b> White discharge from the female reproductive organs (IR:71)  | 71              | 0.600 | 0.986    | 0.591     | Powder                      | Latex mixed honey, then drink<br>Latex mixed honey, then drink   | 34                   |
| 33. | <i>Ficus benghalensis</i> L.<br>(Moraceae) PHC-1338   | Aalam (ஆலம்)                      | Tree      | Stem<br>Bark<br>Seed | 53 | <b>Leucorrhoea:</b> White discharge from the female reproductive organs (IR:50)<br><b>Menorrhagia:</b> Excessive level of blood flow with long days (IR:49)<br><b>Lactation:</b> To increase breast milk secretion during the deficiency of milk at the time of feeding to the child (IR:23) | 122             | 0.441 | 2.301    | 1.016     | Paste<br>Decoction<br>Paste | 50gm of dried stem bark grinds to fine powder and make a paste with honey, then taken orally<br>70gm of dried bark is mixed with honey, then taken Orally<br>Dried seeds grind to a fine powder then mixed with milk and drink | 34                   |
| 34. | <i>Ficus racemosa</i> L.<br>(Moraceae) PHC-1333   | Aththi (அத்தி)                    | Tree      | Bark<br>Fruit        | 78 | <b>Contraceptive:</b> To avoid the unnecessary pregnancy (IR:72)<br><b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:42)   | 114             | 0.650 | 1.461    | 0.950     | Juice<br>Raw                | Fresh bark juice taken orally<br>Fresh fruit eaten daily morning and evening   | 37                   |
| 35. | <i>Ficus religiosa</i> L.<br>(Moraceae) PHC-1308  | Arasam (அரசம்)                    | Tree      | Bark                 | 51 | To induce sterility in women (IR:27)<br><b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:50)   | 77              | 0.425 | 1.509    | 0.641     | Paste<br>Decoction          | Fresh bark grinds paste and taken orally<br>Dried bark boiled in water, then taken orally  | 34                   |
| 36. | <i>Glinus latoides</i> ,<br>Roefl. (Aizoaceae)<br>PHC-1344  | Siruseruppadai<br>(சிறுசெருப்படை) | Herb      | Root                 | 65 | <b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:64)   | 64              | 0.541 | 0.984    | 0.533     | Powder                      | Dried root powder mixed with honey and taken orally  | 23                   |
| 37. | <i>Hemidesmus indicus</i><br>R.Br.<br>(Asclepiadaceae)<br>PHC-1362                                | Nannari (நன்னாரி)                 | Climber   | Root                 | 29 | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk on the time of feeding to the child  | 40              | 0.241 | 1.379    | 0.333     | Paste<br>Powder             | Dried root powder mixed with ghee, then stirred until change paste and eaten<br>Dried root powder mixed with water and drink   | 37<br>34             |

| No. | Plant Name   | Local Name                          | Plant Type | Part                   | Code | Indication  | 1   | 2     | 3     | 4     | Preparation              | 5   | 6             |
|-----|--|-------------------------------------|------------|------------------------|------|---|-----|-------|-------|-------|--------------------------|---|---------------|
| 38. | <i>Hibiscus rosa-sinensis</i> L. (Malvaceae) PHC-1301            | Sembaruththi (செம்பருத்தி)          | Shrub      | Bark<br>Flower<br>Root | 67   | (NI:23)<br><b>Leucorrhoea:</b> White and yellowish discharge from the female reproductive organs (NI:17)<br><b>Abortion</b> (NI:49)<br><b>Amenorrhoea:</b> The absence of menstrual period (IR:63)<br>Over bleeding during menstrual period (IR:39) | 151 | 0.558 | 2.253 | 1.258 | Paste<br>Paste<br>Powder | Bark grinds to paste and eaten<br>6-8 fresh leaves grinds to paste and eaten daily morning<br>Dried root powder mixed with honey and stirred well until change paste, then taken orally | <sup>34</sup> |
| 39. | <i>Ixora coccinea</i> L. (Rubiaceae) PHC-1326                    | Idly poo (இட்லி பூ)                 | Shrub      | Flower                 | 29   | <b>Leucorrhoea:</b> White and yellowish discharge from the female reproductive organs (IR:27)   | 27  | 0.241 | 0.931 | 0.225 | Decoction                | Dried flower boiled with water, then drink  | <sup>41</sup> |
| 40. | <i>Jasminum angustifolium</i> (L.) Willd (Combretaceae) PHC-1314 | Kaattu malli (காட்டு மல்லி)         | Climber    | Flower                 | 94   | Clot of breast milk-Avoid the lactation production of breast (IR:93)  | 93  | 0.783 | 0.989 | 0.775 | Paste                    | Fresh flower knot 6 h in topically in the breast region   |               |
| 41. | <i>Lawsonia inermis</i> , L. (Lythraceae) PHC-1334               | Maruthaani (மருதாணி)                | Shrub      | Leaves                 | 48   | <b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:46)  | 46  | 0.400 | 0.958 | 0.383 | Paste                    | Dried leaves powdered and mixed milk for making paste, then eaten   | <sup>23</sup> |
| 42. | <i>Leucus aspera</i> Link. (H) (Lamiaceae) PHC-1318              | Thumbai (தும்பை)                    | Herb       | Leaves<br>Flower       | 93   | <b>Dysmenorrhoea:</b> painful periods (IR:86)<br><b>Menstrual disorders:</b> Excessive and irregular bleeding on menstrual time (IR:92)   | 178 | 0.775 | 1.913 | 1.483 | Juice<br>Decoction       | Fresh leaves crushed and extracted juice mixed honey, then drink<br>Dried flower boiled in water until extraction well, then drink  | <sup>34</sup> |
| 43. | <i>Lippia nodiflora</i> . Mich. (Verbenaceae) PHC-1357           | Poduthalai (பொதுதலை)                | Shrub      | Leaves                 | 46   | <b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:42)  | 72  | 0.383 | 1.565 | 0.350 | Paste                    | Dried flowers grinds and mixed ghee, then eaten   | <sup>23</sup> |
| 44. | <i>Madhuca longifolia</i> (L.) JFMacbr. (Sapotaceae) PHC-1345    | Iluppai (இலுப்பை)                   | Tree       | Leaves                 | 36   | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk at the time of breastfeeding to the child (IR:30)   | 30  | 0.300 | 0.833 | 0.250 | Paste                    | Fresh leaves grinds to paste, then apply topically in breast the region with coconut oil  | Not Reported  |
| 45. | <i>Mangifera indica</i> L. (Anacardiaceae) PHC- 1302             | Maa (மா)                            | Tree       | Bark<br>Seed           | 63   | To stop bleeding from uterus (IR:46)<br><b>Leucorrhoea:</b> White and yellowish discharge from the female reproductive organs (IR:52)   | 98  | 0.525 | 1.555 | 0.816 | Decoction<br>Powder      | Dried bark boiled in water until to extract well, then drink<br>Seed powder mixed with ghee, then eaten   | <sup>34</sup> |
| 46. | <i>Marsilea minuta</i> L. (Marsileaceae) PHC-1349                | Aarakkerai (அரக்கிரை)               | Herb       | Leaves                 | 83   | Decrease breast milk (IR:82)  | 82  | 0.691 | 0.987 | 0.683 | Paste                    | Fresh leaves grinds to paste and mixed ghee, then eaten   | <sup>23</sup> |
| 47. | <i>Mimosa pudica</i> L. (Mimosaceae) PHC-1327                    | Thottal sinungi (தொட்டால் சிணுங்கி) | Herb       | Root<br>Leaves         | 61   | Vaginitis (IR:58)<br>Prevent the excessive menstrual bleeding (IR:45)   | 103 | 0.508 | 1.688 | 0.858 | Paste<br>Juice           | Fresh root grinds to well and mixed Ghee, then eaten<br>Fresh leaves crushed until  | <sup>34</sup> |

(continued on next page)



Table 2 (continued)

| No. | Botanical name, family & voucher no.                      | Vernacular name                           | Life form    | Parts used                       | IP | Illness treated with no. of IR in each illness   | Total no. of UR | RFC   | CI Value | Use Value | Preparations                       | Solvents used for administration   | Reported Literatures |
|-----|---|---|--------------|----------------------------------|----|--|-----------------|-------|----------|-----------|------------------------------------|--|----------------------|
| 48. | <i>Momordica charantia</i> L. (Cucurbitaceae) PHC-1335    | Pakarkaai (பாகற்காய்)                     | Climber      | Leaves                           | 61 | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk at the time of breastfeeding to the child (IR:56)  | 56              | 0.508 | 0.918    | 0.466     | Paste                              | get juice. Thereafter mixed milk with juice, then drink Fresh leaves grinds to paste and mixed coconut oil, then apply topically in the region of the breast   | Suresh et al., 2013  |
| 49. | <i>Moringa oleifera</i> Lam. (Moringaceae) PHC-1315       | Murungai (முருங்கை)                       | Tree         | Root<br>Bark<br>Leaves<br>Leaves | 95 | Treat some sexually transmitted diseases by the pathogenic microorganism (IR:73)<br>Irregular menstrual period and painful bleeding (IR:78)<br><b>Contraceptive:</b> To avoid the unnecessary pregnancy (IR:73)<br><b>Lactation:</b> To increase breast milk secretion during the deficiency of milk at the time of breastfeeding to the child (IR:83) | 307             | 0.791 | 3.231    | 2.558     | Powder<br>Powder<br>Paste<br>Fumes | Dried root powder mixed with warm milk, then drink Dried bark mixed with honey, then taken orally<br>Fresh leaves fry with Ghee, then taken orally<br>Dried leaves burned with the inside of the pot, then respiratory the fumes |                      |
| 50. | <i>Musa paradisiaca</i> L. (Musaceae) PHC-1359            | Vaazhai (வாழை)                            | Tree         | Stem                             | 52 | <b>Menorrhagia:</b> Excessive level of blood flow with long days (IR:46)   | 46              | 0.433 | 0.884    | 0.383     | Juice                              | Stem juice is taken orally in empty stomach  | <sup>38</sup>        |
| 51. | <i>Nelumbium speciosum</i> , wild (Nymphaeaceae) PHC-1358 | Thamarai (தாமரை)                          | Aquatic Herb | Seed                             | 64 | <b>Leucorrhoea:</b> White and yellowish discharge from the female reproductive organs (IR:62)  | 62              | 0.533 | 0.968    | 0.516     | Powder                             | Dried fruit powder mixed with honey and taken orally in empty stomach at morning   | Not reported         |
| 52. | <i>Ocimum basilicum</i> , L. (Lamiaceae) PHC-1346         | Thiruneetru pachilai (திருநீற்று பச்சிலை) | Herb         | Seed                             | 89 | <b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:82)   | 82              | 0.741 | 0.921    | 0.683     | Paste                              | Seed powder is mixed with water and stirred well until change paste, then taken orally   | <sup>23</sup>        |
| 53. | <i>Ocimum canum</i> Sims. (Lamiaceae) PHC-1319            | Naathulasi (நாதுளசி)                      | Herb         | Leaves                           | 57 | <b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:53)   | 53              | 0.475 | 0.929    | 0.441     | Paste                              | Dried leaves mixed with Ghee, then taken orally  | <sup>23</sup>        |
| 54. | <i>Odina wodifer</i> Roxb. FL (Anacardiaceae) PHC-1348    | Odhiyam (ஒதியம்)                          | Tree         | Leaves                           | 64 | Menstrual disorders: Irregular period and excess bleeding with pain (IR:62)  | 62              | 0.533 | 0.968    | 0.516     | Paste                              | 3–4 leaves pinched and grind with Milk in paste, then taken orally   | Not reported         |
| 55. | <i>Pedaliium murex</i> L. (Pedaliaceae) PHC-1303          | Perunerunchil (பெருநெருஞ்சில்)            | Herb         | Seed<br>Leaves                   | 31 | <b>Amenorrhoea:</b> The absence of menstrual period (IR: 12)<br><b>Dysmenorrhoea:</b> Painful menstruation (IR:3)  | 15              | 0.258 | 0.483    | 0.125     | Powder<br>Juice                    | Seed powder is mixed with honey and taken orally in early morning daily<br>Small amount of leaves, making juice mixed with water and taken orally  |                      |
| 56. | <i>Physalis minima</i> L. (Solanaceae) PHC-1363           | Sodakku thakkali (சொடக்கு தக்காளி)        | Herb         | Leaves                           | 36 | <b>Lactation:</b> To increase breast milk secretion during the deficiency of milk at the time of   | 7               | 0.300 | 0.194    | 0.058     | Decoction                          | Hand amount of dried leaves, making a decoction with water, then taken orally  | Not Reported         |

|     |   |                                       |         |                |     |  |     |       |       |       |                              |   |          |
|-----|---|---------------------------------------|---------|----------------|-----|--|-----|-------|-------|-------|------------------------------|---|----------|
| 57. | <i>Saraca asoca</i> (Roxb.) Wilde (Fabaceae) PHC-1328       | Asokam (அசோகம்)                       | Tree    | Bark<br>Root   | 85  | breastfeeding to the child (IR:7)<br><b>Leucorrhoea:</b> White and yellowish discharge from the female reproductive organs (IR:52)<br><b>Menstrual disorder:</b> Avoid the irregular menstruation (IR:83)                  | 135 | 0.708 | 1.588 | 1.125 | Powder<br>Decoction          | Dried bark powder mixed with Water and then taken orally<br>Boiled root juice taken orally in every morning   | 34<br>37 |
| 58. | <i>Ricinus communis</i> L. (Euphorbiaceae) PHC-1316         | Aamanakku (ஆமணக்கு)                   | Herb    | Leaves         | 44  | <b>Menstrual problem:</b> To promote menstruation (IR:43)  | 43  | 0.366 | 0.977 | 0.358 | Juice                        | 1-2 leaves juice taken orally in every morning daily  | 34       |
| 59. | <i>Rosa damascena</i> , L. (Rosaceae) PHC-1336              | Roja (ரோஜா பூ)                        | Herb    | Flower<br>Seed | 65  | Excess blood bleeding during menstrual periods (IR:62)<br>Blood bleeding between menstrual time and bleeding after sex (IR:42)   | 104 | 0.541 | 1.600 | 0.866 | Decoction<br>Powder          | Dried flower boiled with water, then taken orally<br>Seed powder mixed with Honey, then taken orally  | 23       |
| 60. | <i>Sesbania grandiflora</i> (L.) Poiret (Fabaceae) PHC-1364 | Agaththi (அகத்தி)                     | Tree    | Flower         | 18  | To treat scanty menstruation (IR:12)   | 12  | 0.150 | 0.666 | 0.100 | Paste                        | Dried flower is making on paste with Water, then taken orally   | 34       |
| 61. | <i>Sida acuta</i> Burm. F (Malvaceae) PHC-1352              | Arivaalmanaiipoond (அறிவாழ்மனைபுண்டு) | Herb    | Root           | 20  | <b>Leucorrhoea:</b> White and yellowish discharge from the female reproductive organs (IR:52) (IR:13)  | 13  | 0.166 | 0.650 | 0.108 | Powder                       | Dried root grinds fine, then taken orally with water  | 34       |
| 62. | <i>Smilax zeylanica</i> , L. (Liliaceae) PHC-1347           | Kaattukkodi (காட்டுக்கொடி)            | Climber | Root<br>Leaves | 93  | <b>Leucorrhoea:</b> White and yellowish discharge from the female reproductive organs (IR:52)<br>Weakness during Monthly discharge (IR:92)<br><b>Gonorrhoea:</b> Control the painful urination and white discharge (IR:78) | 262 | 0.775 | 2.183 | 2.183 | Decoction<br>Powder<br>Juice | Boiled root decoction taken orally<br>Dried leaves powder mixed with Honey, then taken orally<br>4–5 fresh leaves crushed and taken juice to drink orally | 37       |
| 63. | <i>Tamarindus indica</i> , L. (Caesalpinaceae) PHC-1317     | Puliyam (புளியம்)                     | Tree    | Fruit          | 34  | <b>Contraceptive:</b> To avoid the unnecessary pregnancy (IR:23)   | 23  | 0.283 | 0.676 | 0.191 | Raw                          | Fresh fruit taken orally  | 34       |
| 64. | <i>Tephrosia purpurea</i> Pers. (Fabaceae) PHC-1329         | Kattukkolinchi (காட்டுக்கொளிஞ்சி)     | Herb    | Root           | 69  | <b>Dysmenorrhoea:</b> Painful menstruation during the menstrual periods (IR:67)  | 67  | 0.575 | 0.971 | 0.558 | Powder                       | Dried root powdered mixed with Honey, then taken orally   |          |
| 65. | <i>Terminalia arjuna</i> W. & A. (Combretaceae) PHC-1337    | Marutham (மருதம்)                     | Tree    | Bark           | 53  | <b>Leucorrhoea:</b> White and yellowish discharge from the female reproductive organs and taken excessive bleeding during menstrual period (IR:42)   | 42  | 0.441 | 0.792 | 0.350 | Paste                        | Dried bark powder stirred with water until change paste, then taken orally  | 34       |
| 66. | <i>Tribulus terrestris</i> , L. (Zygophyllaceae) PHC-1304   | Nerinchil (நெருஞ்சில்)                | Herb    | Root           | 113 | Treat some sexually transmitted diseases by the pathogenic microorganism (IR:92)   | 92  | 0.941 | 0.814 | 0.766 | Juice                        | Fresh leaves grinds well and make juice, then drink   | 22       |

**Table 3**  
Percentage of plant families.

| S. No. | Name of the Family | Number of species | Percentage of the species |
|--------|--------------------|-------------------|---------------------------|
| 1.     | Fabaceae           | 5                 | 7.57%                     |
| 2.     | Cucurbitaceae      | 4                 | 6.06%                     |
| 3.     | Malvaceae          | 4                 | 6.06%                     |
| 4.     | Lamiaceae          | 3                 | 4.54%                     |
| 5.     | Euphorbiaceae      | 3                 | 4.54%                     |
| 6.     | Moraceae           | 3                 | 4.54%                     |
| 7.     | Apocynaceae        | 2                 | 3.03%                     |
| 8.     | Anacardiaceae      | 2                 | 3.03%                     |
| 9.     | Combretaceae       | 2                 | 3.03%                     |
| 10.    | Liliaceae          | 2                 | 3.03%                     |
| 11.    | Mimosaceae         | 2                 | 3.03%                     |
| 12.    | Others             | 33                | 51.51%                    |

used by the traditional practitioners of Vedaranyam (taluk) to treat various ailments were mainly leaves, fruits and seeds. Aerial parts of plant and whole plants were also used in case of small herbaceous plants. The most frequently utilized medicinal plants parts were leaves (32%) used for the preparation of medicine solely, it was followed by root (20%), bark (12%), seed (11%), flower (7%), fruit (6%), stem (5%), latex (3%), tuber (2%), whole plant and male inflorescence (each 1%) (Fig. 3). Considering the mode of preparation of herbal medicines, reports include paste, powder, decoction, juice, raw and fumes. Among these major form of the preparation is paste (31%), powder (26%), decoction (19%), juice (17%), raw (6%) and fumes (1%) (Fig. 4). The present study traditional practitioners of this region often add Ghee used as leaves paste and water used as leaves powder (e.g. *Hemidesmus indicus*), paste is made by crushing

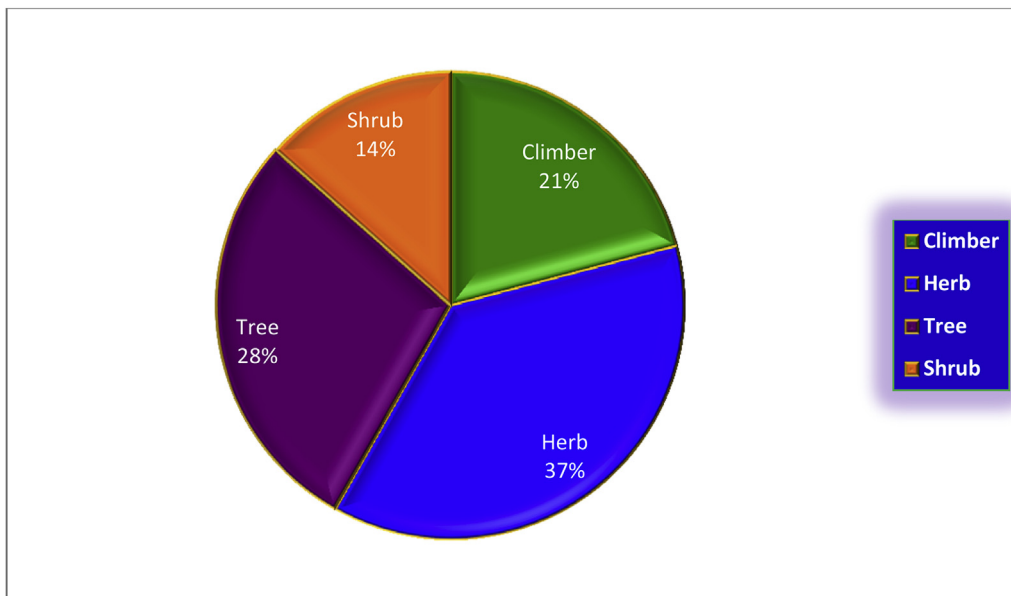


Fig. 2. Percentage of life forms on medicinal plants.

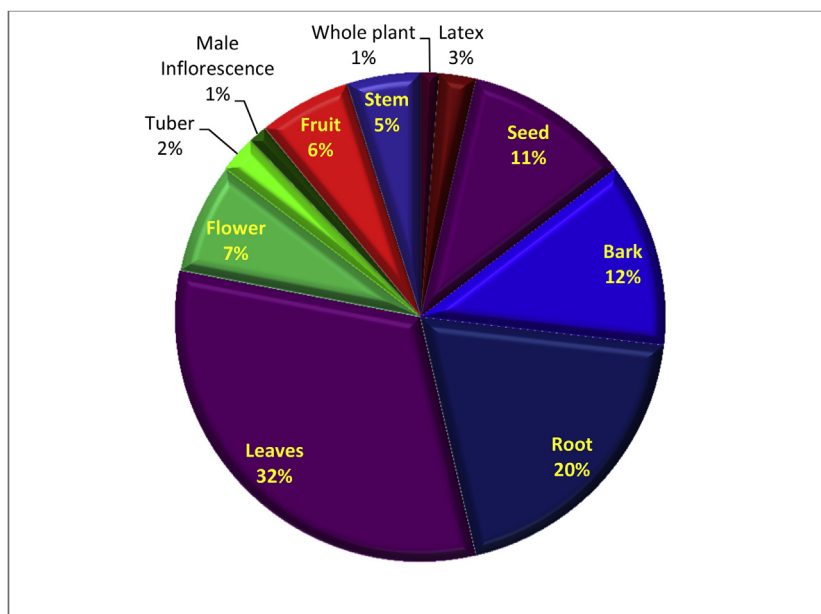


Fig. 3. Percentage of parts used for gynaecological disorder.

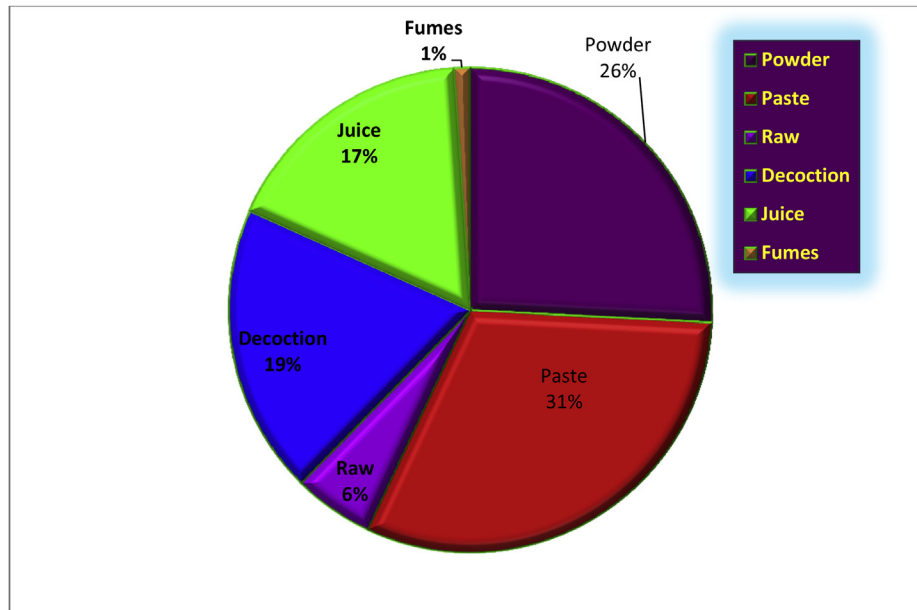


Fig. 4. Percentage of preparation for indigenous medicine.

plant parts using pestle and mortar and when mixing it with ghee and cow milk or salt and honey (e.g. *Hibiscus rosa-sinensis*) The percentage of solvents mixed with the preparations are shown in Fig. 5. Oral administration was the main mode (96%) of intake of medicine followed by external administration (4%) these modes of preparation and administration are the most used in traditional medicine (Fig. 6). A total of 5764 use reports have been documented in these surveys which are categorized in thirty six different ailments. These include Leucorrhoea (12.92%) which is the highest number of records (Table 3). *Moringa oleifera* has the highest number of use-reports (307 UR) in our study followed by *Smilax zeylanica* and *Achyranthes aspera* with 262 and 246 use-reports, respectively, and are placed in first position by CI indices (Table 2). This means that this species has been mentioned by all informants and is the most recognized plant in the region. Also,

because of the highest values of these species have the most diverse uses. *Azadirachta indica*, *Tribulus terrestris* and *Asparagus racemosus* which were ranked first by RFC respectively (Table 2). The most commonly used species was *Moringa oleifera* with 307 use reports by 120 informants, giving the highest use value of 2.588 *Moringa oleifera* is attributed to its use in the treatment of various diseases and it is well recognized all the informants as an lactation (Table 2). The Informant consensus factor (ICF) thirty six ailments were shown in Table 5. The most ailment categories have both the highest level of informant agreement (mean ICF = 0.98) and the total consensus (ICF = 1.00) obtained for clot of breast milk, decrease breast milk, delivery pain, promoting sexual desire, Strengthening, To control over bleeding after delivery, To control menstrual cycle, excessive or prolonged menstrual cycle, hasten the delivery, induces sterility in women, induce uterine contraction

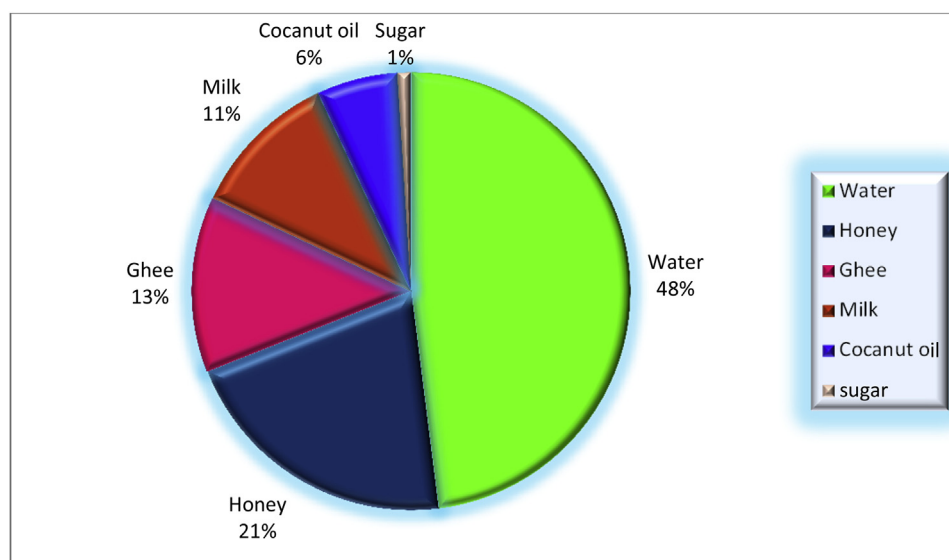


Fig. 5. Percentage of solvent used for preparation. 1). Water a. Both cool & hot water. 2). Milk a. Both fresh & warmed milk.

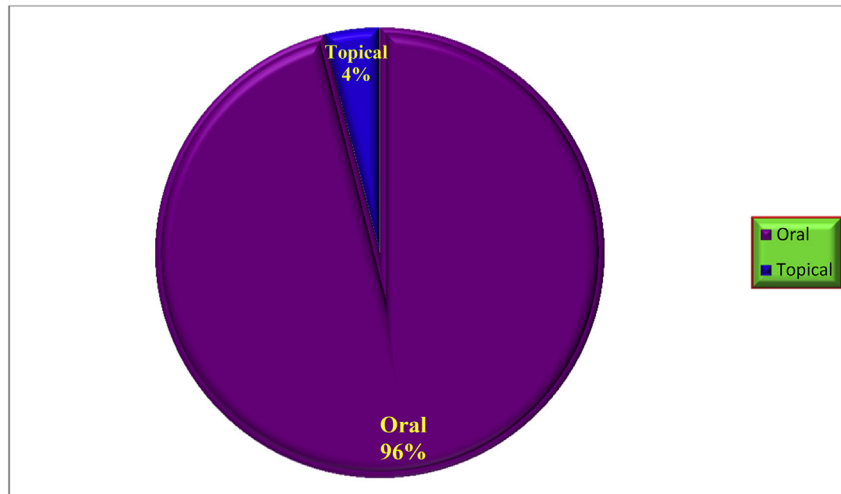


Fig. 6. Percentage of administration.

during child birth, promote menstruation, stop bleeding from uterus, treat scanty menstruation, over bleeding, excess bleeding, urinary obstruction, urinary tract infection, vaginitis, vulvodynia and weakness during monthly discharge (Table 4). The gynaecological complaints rectified commercial drugs have been induced many side effects of the human body. These drug molecules treated gynaecological complaint have categorized with their side effects in Table 5.

#### 4. Discussion

Regarding the demography of the informants, both dominated middle aged practitioners and non-dominated other workers were documented in our studies. As indicated high male-female ratio, womens role as a traditional medical practitioner was less than male practitioner. Still it remains a male exclusive domain. Even in several previous works with traditional medical practitioners in

Table 4  
Informant consensus factor (ICF) for ailments.

| No. | Ailments                                      | $N_{ur}$    | % of UR     | $N_t$     | % of taxa   | ICF  | ICF Rank        |
|-----|---|-------------|-------------|-----------|-------------|------|-----------------|
| 1.  | Abortion                                      | 85          | 1.474       | 2         | 2.020       | 0.99 | 2 <sup>nd</sup> |
| 2.  | Amenorrhea                                    | 233         | 4.042       | 4         | 4.040       | 0.99 | 2 <sup>nd</sup> |
| 3.  | Clot of breast milk                           | 93          | 1.613       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 4.  | Contraceptive                                 | 270         | 4.684       | 4         | 4.040       | 0.99 | 2 <sup>nd</sup> |
| 5.  | Decrease breast milk                          | 82          | 1.422       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 6.  | Delivery pain                                 | 63          | 1.092       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 7.  | Dysmenorrhea                                  | 219         | 3.799       | 4         | 4.040       | 0.99 | 2 <sup>nd</sup> |
| 8.  | Easy delivery                                 | 173         | 3.001       | 2         | 2.020       | 0.99 | 2 <sup>nd</sup> |
| 9.  | Gonorrhoea                                    | 616         | 10.68       | 11        | 11.11       | 0.98 | 3 <sup>rd</sup> |
| 10. | Irregular menstruation                        | 305         | 5.291       | 4         | 4.040       | 0.99 | 2 <sup>nd</sup> |
| 11. | Leucorrhoea                                   | 745         | 12.92       | 13        | 13.13       | 0.98 | 3 <sup>rd</sup> |
| 12. | Menorrhagia                                   | 234         | 4.059       | 4         | 4.040       | 0.99 | 2 <sup>nd</sup> |
| 13. | Menstrual disorders                           | 640         | 11.10       | 9         | 9.090       | 0.99 | 2 <sup>nd</sup> |
| 15. | Promoting Sexual Desire                       | 81          | 1.405       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 16. | Strengthening                                 | 43          | 0.746       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 17. | Control menstrual cycle                       | 117         | 2.029       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 18. | Control over bleeding after delivery          | 53          | 0.919       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 19. | Excessive or prolonged menstrual cycle        | 117         | 2.029       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 20. | Hasten the delivery                           | 18          | 0.312       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 21. | Induces sterility in women                    | 27          | 0.468       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 22. | Induce uterine contraction during child birth | 43          | 0.746       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 23. | Promote menstruation                          | 43          | 0.746       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 24. | Stop bleeding from uterus                     | 46          | 0.798       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 25. | Scanty menstruation                           | 12          | 0.208       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 26. | Over bleeding                                 | 137         | 2.376       | 3         | 3.030       | 1.00 | 1 <sup>st</sup> |
| 27. | Lactation                                     | 511         | 8.865       | 11        | 11.11       | 0.98 | 3 <sup>rd</sup> |
| 28. | Excess Bleeding                               | 103         | 1.786       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 29. | Urinal disorders                              | 96          | 1.665       | 2         | 2.020       | 0.99 | 2 <sup>nd</sup> |
| 30. | Urinary obstruction                           | 85          | 1.474       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 31. | Urinary tract infection                       | 68          | 1.179       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 32. | Uterine disorders                             | 157         | 2.723       | 3         | 3.030       | 0.97 | 4 <sup>th</sup> |
| 33. | Vaginitis                                     | 58          | 1.006       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 34. | Venereal diseases                             | 165         | 2.862       | 2         | 2.020       | 0.99 | 2 <sup>nd</sup> |
| 35. | Vulvodynia                                    | 59          | 1.023       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
| 36. | Weakness during Monthly discharge             | 92          | 1.596       | 1         | 1.010       | 1.00 | 1 <sup>st</sup> |
|     | <b>Total</b>                                  | <b>5764</b> | <b>100%</b> | <b>99</b> | <b>100%</b> |      |                 |

**Table 5**

Catergorized some important commercial drugs and their side effects.

| S. No. | Illness            | Commercial drugs   | Side effects   |
|--------|--------------------|--|--|
| 1.     | Amenorrhoea        | Provera oral medroxyprogesterone<br>Prometrium                   | Breast Tenderness or Discharge, Hives, Itching, Skin rash, Increased acne, Hair growth, Loss of scalp hair, Spotting changes in menstrual periods, Vaginal Itching or Discharge, Changes in appetite, Increased or Decreased weight, Nausea, stomach pain, Bloating, Fever, Sleep problems and Skin color changes.<br>Dizziness, Spinning sensation, Abdominal pain, Headache, Breast pain or Tenderness, Musculoskeletal pain, Joint pain, Viral infection, Diarrhea, Nausea, Bloating, Fatigue, Hot Flashes, Cough, Acne, Changes in weight, Vaginal Itching/Dryness/Discharge, Blurred vision and Drowsiness  |
| 2.     | Leucorrhoea        | Femiforte Capsule  | Nausea, Stomach upset, Skin rash and Acute toxicity  |
| 3.     | Menorrhagia        | tranexamic acid<br>Natazia                                       | Nausea, Vomiting, Diarrhea, Joint or muscle pain, Muscle cramps, Headache or migraine, Runny or stuffy nose, Stomach or abdominal pain<br>Mild nausea, Vomiting, Bloating, Stomach cramps; Breast pain or tenderness; Freckles or darkening of facial skin, acne; Problems with contact lenses Vaginal itching or discharge and very light menstrual periods   |
| 4.     | Dysmenorrhoea      | Ibuprofen  | Upset stomach, Mild heartburn, Nausea, Vomiting, Bloating, Gas, Diarrhea, Constipation, Dizziness, Headache, Nervousness; Mild itching or rash and Ringing in your ears.   |
| 5.     | Uterine disorders  | Naproxen<br>Leuprolide   | Stomach Pain, Constipation, Diarrhea, Gas heartburn, Nausea and Vomiting dizziness<br>Redness/burning/stinging/pain/bruising at the injection site, Hot flashes (flushing), Increased sweating, Night sweats, Tiredness, Headache, Upset stomach and Nausea  |
| 6.     | Abortion           | Carboprost<br>Dinoprostone                                       | Severe pelvic pain, cramping, or vaginal bleeding, High fever, A light-headed feeling, like you might pass out, Shortness of breath, Severe nausea, Vomiting, or Diarrhea;<br>Unpleasant vaginal discharge, Continued fever, Chills and Shivering.<br>Increase in vaginal bleeding several days after treatment, Chest pain or tightness, Skin rash, Hives and Difficulty breathing  |
| 7.     | Over bleeding      | Lynestrenol<br>Tranexamic Acid                                   | Central Nervous System—Headache, migraine, dizziness, Nervousness, Changes in libido and Mental depression. Genitourinary – Breast tenderness and Pain, Swelling and Abnormal uterine bleeding spotting.<br>Headache, Sinus and nasal symptoms, Back pain, Abdominal pain, Musculoskeletal pain, Joint pain, Muscle cramps, Migraine, Anemia and Fatigue.  |
| 8.     | Lactation          | Domperidone<br>Metoclopramide                                    | Dry mouth, Abdominal cramps, Diarrhea, Nausea, Rash, Itching, Hives, and Hyperprolactinemia<br>Feeling restless, Drowsy, Tired, or dizzy, headache, Sleep problems (insomnia), Nausea, Vomiting, Diarrhea, Breast tenderness or swelling and Changes in menstrual periods  |
| 9.     | Excess Bleeding    | Progesterone   | Mild nausea, Diarrhea, Bloating, Stomach cramps; Dizziness, Spinning sensation, Hot flashes; Mild headache, Joint pain, Breast pain or tenderness and cough  |
| 10.    | Vulvodinia         | Gabapentin<br>Effexor XR<br>Amitriptyline<br>Tramadol<br>Topamax | Dizziness, Drowsiness, Weakness, Tired feeling, Nausea, Diarrhea, Constipation, Blurred vision, Headache, breast swelling, dry mouth, loss of balance or coordination<br>Confusion, Numbness and tingling in your arms and legs, Headache, Constipation or diarrhea, Blurred vision, Skin rash, Swelling of your face and tongue and Nausea.<br>headache, dizziness, drowsiness, tired feeling;<br>constipation, diarrhea, nausea, vomiting, stomach pain; r.feeling nervous or anxious; or.<br>itching, sweating, flushing (warmth, redness, or tingly feeling)<br>Tiredness, Drowsiness, Dizziness, Nervousness, Numbness or tingly feeling, Coordination problems, Diarrhea and Weight loss |
| 11.    | Contraceptive      | Elinest  | Acne; breast tenderness or enlargement; changes in appetite; changes in weight; dizziness; headache; mild hair loss; nausea; nervousness; stomach cramps or bloating; vaginal spotting or breakthrough bleeding.   |
| 12.    | Gonorrhoea         | Ceftriaxone<br>Azithromycin                                      | Nausea, Vomiting, Upset stomach, Headache, Dizziness, Overactive reflexes, Pain or swelling in your tongue, Sweating, Vaginal itching or discharge<br>Mild diarrhea, Vomiting, Constipation, Stomach pain or upset, Dizziness, Tired feeling, Mild headache, Nervous feeling, Sleep problems (insomnia), Vaginal itching or discharge, mild rash or itching, ringing in your ears, problems with hearing and Decreased sense of taste or smell.  |
| 13.    | Menstrual disorder | Doxycycline<br>Yaz tranexamic acid<br>Norethindrone              | Nausea, Vomiting, Upset stomach, Mild diarrhea, Skin rash or itching, Vaginal itching or discharge<br>Headache, Sinus and nasal symptoms, Back pain, Abdominal pain, Musculoskeletal pain, Joint pain, Muscle cramps, Migraine, Anemia and Fatigue.<br>Mild nausea, Vomiting, Bloating, Stomach cramps, Breast pain, Swelling, or Tenderness, Dizziness, Freckles or darkening of facial skin, Changes in weight, Vaginal itching or discharge and Skin itching or rash  |

India the same fact was recorded. Mati and De Boer<sup>15</sup> conducted a study in Kurdish markets and reported that women occupied major of part consumers while men occupied major portion of the sellers of traditional medicine. But as far as our study is concerned, major portion of women involved in traditional medicine perform their service as birth attendants. Though the general figure showed a major portion of the practitioners were uneducated or poorly educated, cattle drovers, many of the young practitioners hold degree/diploma. Some of the practitioners also refer the patients to biomedical doctors/technician store view their health status and they are able to read and understand the reports of some basic lab-tests such as blood glucose levels. Some of them are also collecting these reports as a proof efficacy of their treatment. A major portion of the practitioners practice this medicine as a part time job. The consultation charges usually ranged between INR11–51 and in some cases it was free.

In the present study Fabaceae having high number of plant

species recorded. Similarly Prabhu et al<sup>16</sup> and Prabhu and Vijayakumar<sup>17</sup> reported the same findings. Fabaceae also known to have the highest number species, more than any other plant family in the world.<sup>18</sup> The common use of herbaceous medicinal plants was also reported in other parts of the world and attributed to their wide range of bioactive ingredients.<sup>13,19</sup> Traditional practitioners used herbs and trees most commonly as medicine due to the availability in nature.<sup>20,21</sup> These plants can be found growing in home gardens, roadside, riverside, ponds side and inside of the jungle.

In this survey most of the plants are documented in home gardens and roadside. All over the world tribal communities, utilized for the preparation of herbal medicine using leaves.<sup>16,22–24</sup> The leaves were mostly used in traditional people because those aerial parts are collected very easily than underground parts. In scientific point of view, leaves are active in photosynthesis and production of secondary metabolites<sup>25,26</sup>

According to the informants, preparation of paste for the

treatment of ailments is a common method of the tribal communities in global level.<sup>22,27–29</sup> The paste was prepared by grinding the fresh or dried plant parts with oil or water. In some cases, the processing involves drying of the plant material followed by grinding into fine powder. The juice was taken as orally along with water or milk or honey, Raw (taken as raw plant parts orally), Decoction was obtained by boiling the plant parts in water until the volume of water reduce to required amount. Water is commonly used if a solvent is required for the preparation. Sometimes milk or honey is used as a matrix or added to increase a viscosity of the preparation.<sup>30</sup>

Similar results were obtained in previous ethnobotanical surveys carried out in Cameroon and other part of the world<sup>31–34</sup>. Leucorrhoea is the highest number of use category recorded in our study. Similarly Bhatia et al<sup>35</sup> reported that gynaecological studies have shown in other parts of the India, the leucorrhoea (30.9%) is the first use category. The biomedical aspect of the Leucorrhoea associates it with reproductive tract infections, which include local infections, as well as infections caused by sexual transmission. The various studies have reported a high prevalence of disease<sup>36,37</sup>

According to Morvin et al<sup>23</sup> reported *Moringa oleifera* in treatment of uterine disorder and female contraception followed by *Smailax zeylanica* (262 use reports by 120 informants with UV of 2.183) *Achyranthes aspera* (246 use reports by 120 informants with a UV of 2.050). Generally, these plants were frequently used for gynaecological disorders of tribal peoples in Chhattisgarh, India.<sup>38</sup> The very low use value *Physalis minima* (7 use reports by 120 informants with UV of 0.058), *Sesbania grandiflora* (12 use reports by 120 informants with UV of 0.100) and *Sida acuta* (13 use reports by 120 informants with UV of 0.108). In our study *Physalis minima* were a new claim and also used in lactation, others are regularly using this plant in the treatment of scanty menstruation and leucorrhoea.<sup>38</sup>

Similarly Islam et al<sup>39</sup> reported that plants in the study area leads to them low use value as Madhupur forest area, Bangladesh. In an ethnobotanical study of Udhampur District in Jammu Khasmir, similar to our study, informants had the highest level of agreement for most of the ailments (mean ICF = 0.94).<sup>35</sup> This shows the persistent use of traditional medicinal plants by local people in one part of India.<sup>40</sup> This point to the fact that although the local people have access to government health care systems, still medicinal plants have not lost their values among the people living. Also, high Fic values can be used to pinpoint interesting species in search of bioactive compounds<sup>41</sup>

## 5. Conclusion

The present study site has a rich diversity of medicinal plant knowledge among the traditional practitioners for the treatment of Gynaecological disorders. In total 66 plants were reported by 120 informants. The quantitative analysis of the data using RFC, CI, UV and ICF highlighted the most important plants used to cure various gynaecological disorders. The plants such as *Moringa oleifera*, *Smailax zeylanica* and *Azadirachta indica* were also need for further pharmacological analysis so that new drugs can be formulated. The high values of ICF also show a high degree of sharing of ethnogynaecological knowledge amongst the informants. By sharing, they assure the dispersal of this understanding and also increase the possibility of its documentation for the betterment of the future generations.

## Conflicts of interest

The authors declare that they have no conflicts of interest concerning this article.

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## Appendix A

1. Participant's name and surname.
2. Age and gender of the participant.
3. Name of the village.
4. Educational qualifications and occupation of the participant.
5. How long do you live in the residential place?
6. Name of the used medicinal plant.
7. What are the gynecological problems treated?
8. How you make the plants and their products with solvents for gynecological complaints?
9. Did you know how and when will you use the plant?
10. How to prepare traditional medicine?
12. Which problems, mostly occurred in this area?
13. How many people more experience in gynaecological treatment?
14. How many medicinal plants publicly known the gynecological complaints
15. Why you depend mostly on medicinal plants?

## Appendix B

1. How many plants used your parents and grandparents to this gynecological complaints?
2. How they use them?

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