Ethnomedicinal List of Plants Treating Fever in Ahmednagar District of Maharashtra, India

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Received September 11, 2019; Revised October 14, 2019; Accepted October 24, 2019

Abstract A search of ethno-botanical literature revealed that 62 plant species belonging to 32 families are used as ethnomedicines under various preparations in the treatment of fever by ethnic groups residing in Ahmednagar district of Maharashtra, India. A coordinated field study however recorded 71 plant species from 35 families that were explained to deal with fever by the countryside dwellers. Out of these two lists, 23 plant species belonging to 17 families are found common. The total identified families containing all plant species (n=109) are arranged as per the latest edition of Angiosperm Phylogeny Group (APG) Classification System (APG IV, 2016) with indications of newly recorded ones for a future interest.

Keywords Ethnomedicine, Fever, Ahmednagar District, APG Classification

1. Introduction

Fever, also known as pyrexia in modern medical terminology and Jvara in vernacular language, is a common medical symptom and a sign of an increased internal body temperature to the levels above normal temperature i.e. 37°C (98.6°F). Body temperature varies with time of the day, being at lower levels in the morning and higher levels in the evening. Body temperature greater than 41.6°C (107°F), can result in brain damage and possibly death.[1] Fever is commonly associated with many other diseases and thus treated individually and along with other disorders. The febrile response, therefore, remains a significant contributor to the pathogenesis, clinical presentation and outcome of many illnesses and diseases. Consequently, understanding fever and febrile response is vital in the diagnosis, treatment and follow-up of various ailments and diseases. [2] Ethnic groups and countryside people are still depending on ethnomedicinal practices pursued mostly by seniors and experienced individuals among them to heal/cure most of the health related ailments in their periphery. Ethnomedicinal traditions or therapies are having natural potential but have not been adequately and clinically documented to claim equal status of modern medicine. Several ethno-botanical/ethnomedicinal surveys have been carried out in all parts of forest dominated areas during last hundred years including Ahmednagar district of India. There are different objectives attached to these surveys such as studying the floristic and bio-diversity of the region, documenting ethno-botanical, ethno-medico-botanical and ethnomedicinal practices being carried out against different diseases and disorders from different tehsils of the district.[3-12] Present study was focused to enlist the specific plants used to treat patients during fever under ethnomedicine by the locals in Ahmednagar district of India. This will add more information to the database of ethnomedicinal plants for future endeavours.

2. Materials and Methods

2.1. Study Area

Ahmednagar district of Maharashtra state, India lies between 18°2’ and 19°0’N latitudes and 73°9’ and 75°5’E longitudes. The district has 14 tehsils/talukas. Akole and Sangamner tehsils of the district are mostly tribal populated due to forest covers. Therefore, the present study of ethnomedicinal data collection was based at these two Tehsils. The field study was carried out by arranging Botanical excursions for documenting local ethnomedicinal knowledge at different times. Surveys were conducted during the period of July 2016 to June 2018 (covering all the seasons) in tribal areas of the district. The tribal communities namely, Mahadev Koli,
Katkari, Bhill and Thakar are found in Akole and Sangamner Tehsils. Geographically, this part of the district is the foothill zone of the end part of Western Ghats mountain ranges. The assistance of local experts (key informants) belonging to these tribal groups was taken during the survey visits.

2.2. Literature Survey

The review of literature and related studies were carried out from the reports of Ethnomedicinal surveys, floras and botanical analysis of Ahmednagar district published by many authors. The information was also searched for the ethnomedicinal uses of plants mentioned for the treatment of fever from other sources.

2.3. Methods

The methods followed for the survey were i) Interview methods: Informal/qualitative methods (Open ended or semi-structured interviews); ii) Formal/quantitative methods (Systematic or structured interactions through Questionnaires), and iii) Participant Observation method. This was to find and assess how do the local informants use medicinal plants, parts used to make formulations and serve dosage, etc. Random sampling method was used in selecting the study area, sub-areas as well as the informants. Each plant specimen was botanically identified, dried and was made in to herbarium. The voucher specimens are deposited in the herbarium of Swami Ramanand Teerth Marathwada University’s Sub-Centre, Latur, for the purpose of documenting the presence of that particular species of the study area and for future reference. The identified species are arranged family-wise and presented in a Table form. The families in turn are sequenced according to the latest APG-IV (Angiosperm Phylogeny Group - Fourth Version) system of classification (2016). An attempt was also made to use Roman Unicode font with diacritical marks to write the Sanskrit/Marathi/Vernacular words for universal correct pronunciation and understanding.

3. Results and Discussion

3.1. Results

The analysis of Ethnomedicinal data from this piece of work reveals -

A. 62 species belonging to 32 families were recorded from literature studies.
B. 71 species belonging to 35 families were recorded during field studies.
C. Out of 62 species, 37 species belonging to 21 families were found exclusively in literature studies.
D. Out of 71 species, 48 species belonging to 26 families were found exclusively in field studies.
E. Thus a total 109 species belonging to 43 families are recorded for ethnomedicinal way of treatment for fever / Jvara.
F. 23 species belonging to 17 families were recorded as the species common to both the literature records as well as the field studies enumerations.
G. The families Asteraceae, Fabaceae, Apocynaceae and Acanthaceae are the abundant families with respect to utilization of ethnomedicines from those.
H. Table 3 reveals that Herbs constitute the major portion with respect to the habit-wise distribution of plant species followed by Trees, Climbers, Shrubs and Under-shrubs which are used in the treatment of fever.

3.2. Discussion

The ethnomedicinal literature survey on Ahmednagar district enlisted a total of 62 medicinal plant species belonging to 32 families and the present field survey made in the tribal regions revealed 71 ethnomedicinal plants which are ascertained to 35 families (all angiosperms) used for the treatments of fever / Jvara by the locals. There are 23 plant species of 17 families found common in both studies and remaining are different. The details of the total plants, families and ethnomedicinal characteristics, etc. are presented in table 1. Specific marks are given in the table to recognize the differential species in the list. Some of the photographs of plant species and parts used as collected while conducting field visits are also presented here. It has been further observed as per the data that a maximum of 10 species belong to family Asteraceae followed by Fabaceae, Apocynaceae and Acanthaceae, which have medicinal effect on fever / Jvara (Table 2). It is found that the most common plant species from this combined list of literature and field studies is Tinospora cordifolia (Willd.) Hook F. & Thoms (with the maximum score of 12 references). The other common plants are Azadirachta indica A. Juss. and Andrographis paniculata Nees. with 10 references each, followed by Alstonia scholaris (L.) R. Br. (09) and Nyctanthes arbor-tristis L. (09) whereas Santalum album L. (08), Adhatoda vasica Nees. (08) and Vitex negundo L. (08) together are comfortable with the fourth position that they gained. While all other species belong to the common list of 23 plants mentioned earlier. Alstonia scholaris (L.) R. Br. is the only species among these common plants reported from the present field studies and not found in earlier reports of the district. All these plants reported here in the context of treatment of fever would definitely get the attention of investigators for further studies and pharmaceutical research.
| Sr. No. | Family/ | Botanical Name (most probable) with plant authority and family | Local/Vernacular Name (Marathi) | Habit | Part Used | Earlier Reports in Literature | Method(s) of use |
|---------|---------|---------------------------------------------------------------|--------------------------------|-------|-----------|------------------------------|------------------|
| 01      | Family- Piperaceae | **Piper longum** L. | Pimpalī | Climber | Flowers and Fruits | Y[14,20] | 2 | An infusion prepared from 1-2 g dried unripe fruits—a teaspoonful with honey twice a day. |
| 02      | Family- Annaceae | **Annona squamosa** Linn. | Sītāphaḻa | Tree | Fruits | - | The fresh juice prepared from 50 g ripe fruit pulp— to relieve thirst in fever. |
| 03      | Family- Araceae | *# Acorus calamus* L. | Vekhaṃḍa | Herb | Dried rhizome | Y[7,14,16,18,19,23,26] | 7 | The decoction of rhizome 25 g - with a glass of milk twice a day. |
| 04      | Family- Liliaceae | *# Aloe vera* (L.) Barm | Koraphaḍa | A succulent herb | Leaves | Y [3,20,22,23] | 4 | The fresh juice of pulp 5-10 ml mixed with honey a teaspoonful - twice a day. |
| 05      | Family- Zingiberaceae | **Asparagus racemosus** Willd | Śatāvarī | Climber | Tuberosous roots | Y[14] | 1 | 5 g dried root powder in a glass of milk - twice a day. |
| 06      | Family- Commmelinaceae | *# Commelina diffusa* Burm.f. | Kamcata, Kānapeta, Kenā | Herb | Roots | Y [8] | 1 | - |
| 07      | Family- Cyperaceae | *# Cyanoitis cristata* (L.) J.A. & J.H. Schult | Nabhāḷī | Herb | Roots | Y [8,10] | 2 | - |
| 08      | Family- Poaceae | *# Cymbopogon citratus* (DC) Stapf. | Ādraka, Āle (Fresh), Śunṭha (Dry) | Herb | Dried rhizome, Fresh rhizome | Y[10,20] | 2 | - |
| 09      | Family- Menispermaceae | *# Cocculus hirsutus* (L.) Diels | Vāsanavela, Pāṭāḷa garudī | Climber | Roots | Y[7,24] | 2 | A decoction of root a tablespoonful - twice a day. |
| 10      | Family- Crassulaceae | *# Tinospora cordifolia* (Willd.) Hook F. & Thoms | Guḷavela | Climber | Stem | Y[3,6,7,8,13,14,17,19,20,22,23,24] | 12 | The fresh juice 5 ml of the crushed stem mixed with honey- twice a day in intermittent, chronic, typhoid or dengue fever. |
| 11      | Family- Cymbopogonaceae | *# Bryophyllum pinnatum* (Lam.) Oken Syn. Kalanchoe pinnata (Lam.) Pers. | Pānaphuṭī | A succulent herb | Leaves | Y[11] | 1 | - |
| Family- Fabaceae | | | | | |
|---|---|---|---|---|
| **Caesalpinia bonduc (L.) Roxb. Dandy & Exell.** | Sāgaragoṭā | Shrub | Root bark, Leaves and Seeds | Y[13,14,17,20,23,24] | 6 | The decoction of powdered bark of root ½ g – in remittent and intermittent fevers. |
| **Cassia fistula L.** | Bahāvā | Tree | Fruits | Y[17,20,23] | 3 | Decocction of the fruit pulp 5 g - once in a day for 2-3 days. |
| **Cassia tora Linn. Syn. Senna tora (L.) Roxb. Cassia obtusifolia L.** | Tākalā | Shrub | Leaves | Y[19,24] | 2 | Leaf decoction - once daily in high fever. |
| **Clitoria ternatea L.** | Gokarṇa, Viṣṇukrāntā | Climber | Leaves | Y[17,19] | 2 | The paste of Leaf mixed with the paste of adrak (Zingiber officinale) 1 g each - applied on forehead. |
| **Indigofera cordifolia Heyne ex Roth** | Godhaḍī, Becakā | Herb | Roots | Y[8] | 1 | The root paste made with water - with a teaspoonful of honey. |
| # Mucuna pruriens (L.) DC. Syn. M. prurita Hook. | Khāja kuiṛ, Khāja kuiś | Climber | dried mature seeds, dried roots | Y[8,17,19,20,23] | 5 | - |
| *# Sesbania grandiflora Pers. | Agastā, Hādagā, Śevarī | Tree | Whole plant† | Y[4] | 1 | Flowers are fried and eaten as vegetables. |
| **Tamarindus indica L.** | Cinca | Tree | Fruits | Y[17,19,20,23,24] | 5 | The juice made from 1-2 ripe fruits soaked overnight in water and then jaggery is added – drunk early morning on an empty stomach. |
| **Tephrosia purpurea (L.) Pers** | Unkali | Under-Shrub | Roots | Y [13,17,19,24] | 4 | The root paste 5 g made with the rhizome of ginger (Zingiber officinale) and black paper - with a teaspoonful honey. |
| Family- Rhamnaceae | | | | | |
| **Ziziphus jujuba Lamk. Syn. Z. mauritiana Lamk Syn. Rhamnus jujube L.** | Bora, Borāṭī | Tree | Fruits | Y[17,23,24] | 3 | Sharbat (Juice) is prepared from the fruit pulp after removing seeds to relieve thirst during high fevers. |
| Family- Moraceae | | | | | |
| **Ficus racemosa Linn. Syn. Ficus glomerata Roxb.** | Umbara, Udumbara | Tree | Latex | - | - | The milky latex that is obtained early in the morning - 8-10 drops along with rock sugar. |
| **Ficus religiosa L.** | Pimpāḷa | Tree | Leaves | Y[13] | 1 | Decocction made from the leaves, ale (rhizome of Zingiber officinale) and kale mire (fruits of Piper nigrum) suppresses shivering in fever. |
| Family- Cucurbitaceae | | | | | |
| # Coccinia grandis (L.) Voigt. | Tondallī | Climber | Leaves | Y[7,17] | 2 | - |
| # Corallocarpus epigaeus (Rottl.) C. B. Cl. | Māṅgullā, Kondā | Climber | Tubers | Y[10] | 1 | - |
| # Diplocyclos palmatus (L.) Jeffrey | Śīvalingī | Climber | Fruits | Y[10] | 1 | - |
| **Momordica dioica Roxb. exWild.** | Karotola, Karatoli | Climber | Root, Tuber | Y[17] | 1 | The tuberous roots of female plants are ground with water to form paste - rubbed lightly on body. |
| **Momordica charantia Linn.** | Kārale | Climber | Fruits | Y[17,19,20,21] | 4 | The fruits are eaten as vegetables purposely in |
| Family- Celastraceae | **Celastrus paniculatus** Willd. | Kāṃguṇī, Māḻakāṃgoṇī, Māḻa kōmgoṇī, Jyotiṣamāti | Climber | Seeds | Y[23] | 1 | The seeds are boiled in water to extract the oil. 1-2 drops of oil are added as nasal drops - twice a day. |
|---------------------|--------------------------------|---------------------------------|--------|------|------|---|-------------------------------------------------|
| 16 Family- Euphorbiaceae | # *Bridelia retusa* (Linn.) Spreng. | Asaṇā, Asanā | Tree | Stem bark | Y[10] | 1 | - |
| **Emblica officinalis** Gaertn. Syn. *Phyllanthes emblica* L. | Āvalā, Āvalaṅkāṭhī | Tree | Dried mature fruits | Y[19] | 1 | The dried mature powdered fruits along with the fruits of *Hirda* (*Terminalia chebula*) and *Behda* (*Terminalia bellerica*) 2 g each - given orally. |
| **Euphorbia neriifolia** L. | Sābara | Shrub | Latex | - | The milky latex 5-10 drops mixed in half teaspoon of honey - given orally. |
| **Jatropha curcas** L. | Mogalī erāmda, Rāṇa erāmda | Shrub | Leaves | Y[14,19] | 2 | The decoction of the boiled leaves (to minimize toxicity) 5-10 ml - along with the lime juice. |
| 17 Family- Combretaceae | **Terminalia arjuna** (Roxb.) Wight. & Am. | Arjuna, sāḍāḷ, Arjunāsāḍāḷa | Tree | Stem bark | Y[13,17,19,20,23] | 5 | The powdered bark 5 g - along with a glass of milk twice a day, |
| **Terminalia chebula** Retz. | Haradā, Hiraḍā, Haraḍa | Tree | Dried mature fruits | Y[14,17,19,20,21] | 5 | The dried mature fruits along with the fruits of *Behda* (*Terminalia bellerica*) and *Avala* (*Emblica officinalis*) powdered 2 g each - given orally. |
| **Terminalia bellerica** Roxb. | Behāḍā | Tree | Dried mature fruits | Y[3,17,19,20,23] | 5 | The dried mature fruits along with the fruits of *Hirda* (*Terminalia chebula*) and *Avala* (*Emblica officinalis*) powdered 2 g each - administered orally. |
| 18 Family- Lythraceae | **Panica granatum** L. | Dāḻiṃba | Shrub | Fresh fruits | Y[19] | 1 | A fresh juice prepared from the fruits - a full glass twice a day in high fever. |
| # *Ammannia baccifera* L. | Bhara-jāṃbhāḷa | Herb | Fresh or dried plants | Y[8,25] | 2 | - |
| 19 Family- Sapindaceae | # *Cardiospermum halicacabum* L. | Kapāḻaphoḍī | Climber | Whole plant | Y [3,14,17,19] | 4 | - |
| 20 Family- Rutaceae | *Aegle marmelos* (L.) Correa Ex. Schultz | Bela | Tree | Dried ripe fruit pulp | Y[7,14,17,19,22,23] | 6 | The fresh juice prepared from 1-2 g dried ripe powdered fruit pulp - a cupful twice a day. |
| *# Murraya koenigii* (L.) Spreng. | Kadhippattā | Tree | Leaves | Y [9,17,19,23] | 4 | A teacupful decoction of the leaves - twice a day. |
| # *Ruta chalepensis* L. | Satāpa | Herb | Leaves | Y[3,11,14] | 3 | - |
| 21 Family-Simaroubaceae | | | | | | |
| **| **| **| **| **|
|---|---|---|---|
| 22 | Family- Meliaceae | **Ailanthus excelsa** Roxb. | Mhāḍu, Mārkha, Mahārukha | Tree | Leaves and bark | Y[17,19,23] | 3 | Decoction of bark 50 ml - twice a day. |
| 23 | Family- Moringaceae | **Azadirachta indica** A. Juss. | Limba, Kadulimba | Tree | Stem bark | Y[3,7,10,13,14,16,17,19,20,24] | 10 | Decoction of stem bark a 50 ml - along with some jaggery twice a day to cure general, intermittent, malarial or dengue fever. |
| 24 | Family- Malvaceae | **Moringa pterygosperma** Gaertn. Syn. **Moringa oleifera** Lam. | Śevagā | Tree | Seeds | Y[17,19,21,24] | 4 | Decoction of seeds made in 100 ml of water - to be drunk at a time. |
| 25 | Family- Santalaceae | **Abutilon indicum** (L.) Sweet. | Peṭārī, Kāsālī, Atibala | Shrub | Leaves | Y[14,17,19,20,22,23] | 6 | An infusion of 5 g leaf powder - a teacupful 2 times a day. |
| 26 | Family- Plumbaginaceae | **Sida acuta** Burm.f. | Tapakadā, Cikanā, Bala | Under-Shrub | Roots | Y[17,19,23] | 3 | An infusion of 5 g roots mixed with ginger - a teacupful 2 times a day. |
| 27 | Family- Polygonaceae | **Sida cordifolia** L. | Cikanā, Bala | Under-Shrub | Roots | Y[14,17,19,20,22] | 5 | Decoction of the roots with the rhizome of ginger (Zingiber officinale) 50 ml - relieves shivering in fever. |
| 28 | Family- Santalaceae | **Santalum album** L. | Caṃdana, Sapheda camdana | Tree | Dried heart wood | Y[11,18,19,20,21,22,23,26] | 8 | The powder of dried heart wood 2 g mixed in coconut water - twice a day. |
| 29 | Family- Plumbaginaceae | **Plumbago zeylanica** L. | Citraka, Sapheda citraka | Herb | Dried mature roots | Y[8,10,17,19] | 4 | A tincture made from the bark of dried mature roots - orally 2-3 drops twice a day. |
| 30 | Family- Polygonaceae | **Polygonum glabrum** Willd | Śerala | Herb | Whole plant | Y[18,23] | 2 | A teacupful of the decoction of the entire plant - twice a day. |
| 31 | Family- Nyctaginaceae | **Aerva lanata** (L.) Juss. Ex Schult. | Kāpurā-mādhurī | Herb | Dried, whole plant | Y[8,13] | 2 | An aqueous extract made from 1 g ash of dried leaves - half cup twice a day. |
| 32 | Family- Polygonaceae | **Aerva lanata** (L.) Juss. Ex Schult. | Kāpurā-mādhurī | Herb | Leaves | Y[16] | 1 | Juice of 10 g leaf powder - twice a day for 3-4 days in malarial fever. |
| 33 | Family- Nyctaginaceae | **Alternanthera sessilis** (Linn.) R. Br. ex DC. | Bēcakusāla | Herb | Whole plant | Y[23] | 1 | A cup of decoction made by boiling the entire plant - twice a day. |
| 34 | Family- Polygonaceae | **Celosia argentea** Linn. | Kuradā, Kukadā, Kombadā | Herb | Seeds | Y[14] | 1 | A teacup of decoction of the boiled seeds - twice a day. |
| 35 | Family- Nyctaginaceae | **Boerhavia diffusa** L. | Pāṃḍhārī-punarnavā, Punarnavā | Herb | Dried, whole plant | Y[3,8,19,20] | 4 | - |
| 36 | Family- Ebenaceae | **Diospyros malabarica** (Desr.) Kostel. | Źembaruṇī | Tree | Bark | Y[17,19,25] | 3 | Bark decoction 50 ml - in typhoid fever. |
| 37 | Family- Rubiaceae | **Hedyotis diffusa** Willd | Taroti | Herb | Whole plant | Y[8] | 1 | - |
| No. | Family | Genus | Species | Type | Y-Numbers | Uses |
|-----|--------|-------|---------|------|-----------|------|
| 32  | Gentianaceae | *Enicostema axillare* (Lam.) Raynal | Nāi, Choṭā cirāyata | Herb, Roots | Y[8,13] | |
| 33  | Apocynaceae | *Alstonia scholaris* (L.) R. Br. | *Saṭavina* | Tree, Stem bark | Y[13,16,18,19,20,21,22,23,25] | Infusion of powdered bark of stem 5 g mixed with honey - teaspoonful twice a day. |
| 34  | Apocynaceae | *Carissa carandas* Linn. | *Karavamda* | Shrub, Leaves | Y[5,14,18,23] | |
| 35  | Apocynaceae | *Catharanthus pussilus* (L.) G.Don. | *Cāṃḍāṇi* | Herb, Stem, Leaves | Y[10] | |
| 36  | Apocynaceae | *Holarrhena antidysenterica* (Roth.) A. DC Syn. *Holarrhena pubescens* (Buch.- Ham.) Wall. ex G. Don. | *Kuḍā, Pāṃḍharā kuḍā* | Tree, Dried seeds | Y[16,18,19,20,22,23] | 2 g dried seed powder - in a glass of milk twice a day. |
| 37  | Rauvolfia | *Rauvolfia tetraphylla* Linn. | *Hāḍakī* | Shrub, Dried roots | Y[10,18] | |
| 38  | Asclepiadoideae | *Calotropis procera* (Ait.) R. Br. | *Ruī, Ruṭī* | Shrub, Root bark | Y[19,23,25] | The root bark powder 1 g with honey - twice a day. |
| 39  | Convolvulaceae | *Argyreia nervosa* (Burm.F.) Boj. | *Samudrasoka* | Climber, Tuber | Y[3] | |
| 40  | Convolvulaceae | *Hemidesmus indicus* (L.) R. Br. | *Anamtamīṭa, Upalassār* | Climber, Roots | Y[3,13,14,18,19,23,25] | The root powder 2 g in a glass of milk - twice a day. |
| 41  | Scrophulariaceae | *Pergularia daemia* (Forsk.) Choiv. | *Utaraṇīcā velā* | Climber, Leaves | Y[8,13,14,19] | A fresh leaf juice 10 ml - twice a day. |
| 42  | Solanaceae | *Physalis angulata* L. | *Popaṭī* | Herb, Whole plant | Y[4] | The fresh juice 15 ml prepared from the leaves - to relieve thirst. |
| 43  | Solanaceae | *Solanum nigrum* L. | *Kāmonī* | Herb, Leaves | Y[18,19,23] | |
| 44  | Solanaceae | *Solanum virginianum* L. Syn. *Solanum sambucarum* Schrad & Wendl. | *Bhuḍ-rimgaṇī, Kāṭe-rimgaṇī* | Herb, Dried mature roots | Y[8,14,20,23,25] | Decoction of dried mature roots 25 ml mixed with that of Gulvel (*Tinospora cordifolia*) 25 ml - as a source of energy in dengue fever. |
| 45  | Scrophulariaceae | *Withania somnifera* (L.) Dunal. | *Ohora gunja Āskamāda, Āvagamādhā* | Under-shrub, Dried mature roots | Y[4,11,13,14,18,19,23] | |
| 46  | Oleaceae | *Nyctanthes arbor-tristis* L. | *Pārijāta, Pārijātaka* | Tree, Leaves | Y[7,13,16,18,19,20,22,23,25] | 10 ml of fresh juice from the boiled leaves with honey - twice a day. |
| 47  | Scrophulariaceae | *Bacopa monnieri* (L.) Pennel. | *Brāhmī, Nirbrāhmī* | Herb, Leaves | Y[18,19,20,25] | A fresh leaf juice 10 ml (5 ml for children) - twice a day. |
| 48  | Scrophulariaceae | *Centranthera indica* (L.) Gamble | *Umḍirakāṇī* | Herb, Dried Whole | Y[8,14,23] | |
| Plant Name | Family | Part Used | Description | Uses |
|------------|--------|-----------|-------------|------|
| **Adhatoda vasica Nees.** Syn. *Justicia adhatoda* L. Syn. *Adhatoda zeylanica* L. | Acanthaceae | Leaves, Flowers | Y[7,16,18,19,20,21,22,26] | A cup of decoction made from the fresh leaves 10 g and flowers 2 g boiled in water twice a day in malarial fever. |
| **Andrographis paniculata Nees.** Syn. *Justicia paniculata* Burm. f. | Acanthaceae | Dried mature stem and leaves | Y[8,13,14,16,18,19,20,22,23,26] | The cold infusion of the kade of Chirayat i.e. the dried stem pieces 10 g soaked in a glass of water for about 6-8 hours a day/night – 2 tablespoons twice, also recommended for dengue and malarial fever. |
| **Barleria prionitis** L. | Acanthaceae | Leaves | Y[3,18,19,20,26] | 5 - |
| **Hygrophila schulli** (Ham.) M.R. & S.M. Almeida | Acanthaceae | Whole Plant | Y[13] | 1 A decoction of root 4-5 teaspoonful - twice a day. |
| **Peristrophe bicalyculata** Nees. | Acanthaceae | Roots | Y[18] | 1 A teacupful of the extract of the roots - twice a day. |
| **Rostellularia japonica** (Thrub.) Ellins | Acanthaceae | Whole plant | Y[8] | 1 - |
| **Rostellularia procumbens** (L.) Nees. | Acanthaceae | Whole plant | Y[8,14] | 2 - |
| **Rungia repens** (L) Nees | Acanthaceae | Whole plant | Y[8,18,23] | 3 - |
| **Pachyptera hymenaea** (DC.) Genetry | Bignoniaceae | Leaves | Y[8] | 1 - |
| **Clerodendrum serratum** (L.) Moon. | Verbenaceae | Dried roots | Y[8,18,19,20,23] | A teaspoonful of root decoction - twice a day in malarial fever. |
| **Lantana camara** L.var. aculeata Moldenke. | Verbenaceae | Whole plant | Y[14,18] | 2 A teacupful of decoction of whole plant - twice a day. |
| **Vitex negundo** L. | Verbenaceae | Leaves | Y[3,8,11,14,18,19,20,23] | 8 A teaspoonful of extract of young leaves - twice a day for 3 days. |
| **Pogostemon benghalensis** (Burm .f.) Kuntze | Verbenaceae | The fresh leaves powdered and dissolved in a glass of milk – once a day. |
| **Artemisia nilagirica** (Clarke) Pamp. | Lamiaceae | Leaves | Y[14,20] | 2 1-2 g leaf powder dissolved in a glass of ... |
Fever is mostly an indication of infection. According to Modern sciences, antipyretic medicines are NSAIDs (Non-Steroidal Anti-Inflammatory Drugs) that usually act by inhibiting prostaglandin synthesis within the hypothalamus region that acts as temperature regulator in our body. But as per Ayurveda, the ancient traditional medicinal system of India, plant substances which have dominance of bitter taste (Tikta Rasa) like, Cirāta (Andrographis paniculata Nees.), Guḍūci (Tinospora cordifolia (Wild.) Hook F. & Thoms or Nima (Azadirachta indica A. Juss.) contain the property of reducing fever (Jwara Hara). Tikta Rasa reduces toxins / poisons and checks fever. Such plants are commonly found in this list made in this study.

The objective behind preparing this list is to attract the attention of those researchers who have interest in folk medicines. The research workers will find the list as a new starting point for further investigation because the newly documented plants have potential for use as source of new drugs for the treatment of fever. Further Pharmacognostic, phytochemical, pharmacological, biotechnological and clinical studies will enable the validity of the present inquired information.

4. Conclusions
Figure 1. *Artemisia nilagirica* (Clarke) Pamp. (*Davna*)

Figure 2. *Sida cordifolia* L. (*Chikna*)

Figure 3. *Momordica dioica* Roxb. exWilld. (*Kartol Root Tuber*)

Figure 4. *Cocculus hirsutus* (L.) Diels (*Wasan vel*)

Figure 5. *Andrographis paniculata* Nees. (*Oli Kirayat*)

Figure 6. *Aerva lanata* (L.) Juss. Ex Schult. (*Kapuri-madhuri*)
Acknowledgements

We are very grateful to ethno-informants from the study area for their valuable information that helped prepare this list.

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