## Chapter 2 Literature Survey

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Subtitle</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Ethnomedico-botanical studies in India</td>
<td>23</td>
</tr>
<tr>
<td>2.2</td>
<td>Ethnobotany in Andhra Pradesh</td>
<td>25</td>
</tr>
<tr>
<td>2.3</td>
<td>Ethnobotanical studies in Anantapur district</td>
<td>28</td>
</tr>
<tr>
<td>2.4</td>
<td>Antioxidant activity</td>
<td>29</td>
</tr>
<tr>
<td>2.5</td>
<td>Antimicrobial activity</td>
<td>34</td>
</tr>
<tr>
<td>2.6</td>
<td>Anthelmintic activity</td>
<td>42</td>
</tr>
</tbody>
</table>
CHAPTER 2

LITERATURE REVIEW

2.1. Ethno medico-botanical studies in India

A thorough review of literature on ethnobotanical studies revealed that the adivasi tribes and their habits received maximum importance of folk information for scientific validation. Initial studies on ethanol botany in the world in last about 75 years have been primarily in inventories of plant of a certain region or specific ethnic group. The position in India has also become the same. It believes estimated that the ethnobotanical relation of about 50% flora has been recorded by S.K. Jain [34].

A part of publication in books and journals on a wide range of information system or currently available for all aspects of ethnobotanical research, including specialized databases like SEPASAL, PLANIMAL (Plant, Animal Interactions), NAPRALERT (Natural Products Alert) was explained by Loub et al.,[35] and MEDFLOR (Medicinal Flora - Beecher and Gyllenhaal, lalramnghinglova and Jha [36] published a review article in Ethnobotany narrating the work done up to 1999 in the field of ethnobotany all over the world with special reference to India state wise. Deepal Warhol [37] published around 137 selected references on ethno botany, published by different research workers during the years 2003-2004.

Soundtrack of conventional knowledge in India can be old-fashioned back to several millennia, in view of the fact that the time of
the Vedas. For example, in Rigveda, the healing properties of herbs were found which is deemed to be the oldest recorded information in India. Atharva Veda, Charaka Samhita and Sushrutha Samhita (1000-500 BC) are the chief classic that give a exhaustive explanation of over 700 herbs were studies by Patwardhan et al.[38]. In modern times, ethnographers and scholars of sociology, linguistics, history, etc., have recorded traditional knowledge with their own perspectives. During the last six decades ethnobotanists have recorded voluminous data, on traditional knowledge and much of this work has been catalogued in bibliographies [80]. Jain et al.[39] and also on a synoptic overview given by Jain and Srivastava [40]. The ethnobotanical work in India so far has been broadly described.

The history of ethnobotanical study in India is about four to five centuries old when Garcia DA Orta (1563) published his 'Oscoloquis' giving an account of indigenous medicinal plants of India but without using the term ethnobotany.

Anthropological studies on South Indian tribes have been carried out since the beginning of the 20th century by Thurston [41] and Raghavaiah [42]. The earlier investigators used to list out the plants which were associated with the food and culture and very little information ware available with regard to plants used for medicinal purposes. However, in current times, there has been a tremendous augment in the interest of studying medicinal plants by various aboriginal tribes in different parts of India.
Organized ethnobotanical work in India started with the publications of Janaki Ammal and Jain [43,44]. These studies not only formed the foundation of modern ethnobotany, but also motivated research workers from different parts of the country to undertake ethnic-medicobotanical studies in their areas.

In India, the publication of ethnobotanical data intensified during 1920’s as traditional herbal medicine received considerable attention. Extensive ethnobotanical studies were made in different parts of the Indian subcontinent during the post independence time. Chopra et al., [45] provided a glossary for Indian medicinal plants. They took out a supplement to it in 1969. Kirtikar et al.,[46] "Indian medicinal plants" and Nadkarni's [47] "Indian Materia Medica" are considered as monumental publications on medicinal plants. Jain et al., [48] reviewed the bibliography of the ethnobotany of India

2.2. Ethnobotany in Andhra Pradesh

Andhra Pradesh state has received less attention on ethnobotanical studies. The first recorded study on Ethnobotany in Andhra Pradesh was that of Pal and Banerjee [49] who reported 22 known plants used by tribes, which has triggered the attention of many workers in ethnobotanical studies of Andhra Pradesh [89]. Jain et al., [107] studied 32 curative plants by adivasis in Andhra Pradesh and Orissa.

Hemadri [50,51,52,53,54,55] contributed a lot for the development of ethnobotany in Andhra Pradesh. He also studied the tribes of Andhra
Pradesh and their knowledge of herbs in nutritional and medicinal values. Harasreeramulu [56] published a significant note on the serviceable value of medical-flore of Rampa agency, while Sudhakar [57] mentioned the curative value of plant used by the tribals and Koyas of East Godavari district. Reddy [58] recorded 34 medicinally important plants of Polavaram agency.

35 medicinal plants of Girijans and adivasis of Vijayanagaram district, was studied by Venkaiah[111]. Hemadri [53] evaluated traditional drugs on rheumatism. Singh et al., [59] curative plants used by the home-grown tribe of Mannanur and also premeditated on the natural activity of these plants [93].


Hemadri et al., [64] worked on the 511 species of curative plant prosperity of the Andhrapradesh. Nagaraju and Rao [65] conduct a investigation on plant rudimentary drugs of Rayalaseema. Aruna kumar and Nisteswar [66] placed 188 medicinal plant species of Kakinada region, Vedavathy et al., [67] reported antipyretic activity of six indigenous medicinal plants from Rayalaseema used for family planning
and birth control. Ravishankar and Henry [68] examined on the 30 impending plant kind from Adilabad district.

Reddy [69] conducted ethnobotanical and phytochemical studies on medicinal plants in Kadapa district. Rama Rao and Henri [70] studied the ethnobotany of parts of the Eastern ghats of Andhra Pradesh. Goud and Pullaiah [71] reported 40 plants used in ethnoveterinary medicine by the Chenchus, Sugalis and Erukala tribes of Kurnool district. Reddy et al., [72] reported 18 known tuber yielding plants belonging to 10 families from Eastern Ghats of Andhra Pradesh. Vedavathy and Mrudula [73] examined the traditional medicines practiced by the Yanadi tribes of Andhra Pradesh. Rajendram et al., [74] gave an account of the rare and notable Texas in an around the eastern ghats of Andhra Pradesh with their potential value to human population in these regions. Kumar and Pullaiah [75] conducted ethnomedico-botanical survey of Mahaboobnagar district and reported 50 selected species of medicinal importance, Sudhakar [76] worked on the angiosperm weeds in Chittoor district. Venkata Raju and Reddy [77] have made a special work in assuring rare and motivating plants from Cuddapah hills. Six endemic curative plants used by the tribal inhabitants of Tirumala hills in Chittoor district were raised by Savithramma et al. Satya [78] exemplified ethno botanical survey in Nellore district. While Nagalakshmi [79] worked on the infertility and abortion plants used by the tribes of Rayalaseema, Andhra Pradesh, India. Muralidhar Rao and Pullaiah [80] conducted ethno-medico-
botanical survey of Guntur district. Jeevan Ram and Venkata Raju [81] studied the good organization of rudimentary drugs second-hand by adivasi tribes of Andhra Pradesh for skin diseases.


Krishna Prasad et al., [84] reported some monetary magnitude of undomesticated plants from East Godavari district. Venkatarathnam and Venkata Raju [85] recorded 46 species from Gundla Brahmeswara wild life sanctuary, A.P. while Reddy et al., [86] reported 35 species from the Eastern Ghats of Andhra Pradesh uses as ethno veterinary medicine for treating livestock.

2.3. Ethnobotanical studies in Anantapur district

Flora of Anantapur district has been worked out by Pullaiah and Yashoda [87] in which 707 vascular taxa belonging to 397 genera and 105 families were reported. Later Ravi Prasad Rao et al., [88] reported 96 plants to the flora of Anantapur district after Pullaiah and Yesoda [87]. Earlier records of the plants encountered in the district include the work done by Gamble [89] on the flora of precedence of Madras.

A painstaking review of literature of the ethno-botanical studies in Andhra Pradesh come to a conclusion that very little attention was received on the ethnobotanical studies of Anantapur district. Jeevan
Ram et al., [81] examined the 48 curative plants used by the Jali tribes of Gooty forests in Anantapur district, A.P. Bakshu et al., conducted[82] phytochemical and antimicrobial activity of the essential oil composition of pimpinella tirupatiensis.

Aswartha and Ali Moulali carried out a preliminary survey of ethnomedicinal plants from the forests of Anantapur district, Andhra Pradesh. Thirupal Reddy [90] surveyed the Eswaramala forests from Anantapur district and reported 102 medicinal plants used for various diseases. The present region of study is not surveyed extensively which possesses diversified vegetation of temperate deciduous and scrub elements. Moreover, as biotic interference is more in this area, there is a constant threat to the biodiversity. So, the present exploration was passed out in this area, to study the diversified medicinal plants.

So, it has become the need of the hour to collect, preserve and document valuable information on medicinal plants from the forests of Anantapur district, Andhra Pradesh, for future use, before their depletion.

2.4. Antioxidant activity

Antioxidants is said to be prevalent with the oxidative damage caused by free radical and protects the cardiovascular and anti-inflammatory diseases. Elevated radical scavenging activity was pragmatic in extracts of the stem of Kigelia, a leaf extracts of the Hibiscus. Azinobis, DPPH and ferric reducing antioxidant power is
used for estimation of total antioxidant activity and is expressed in TEAC. The standard used for insecticide activity was Permethrin. The highest percentage of mortality is observed in Digitalis purpura. Ascorbic acid is used as a reference standard. Liu Q, et al., revealed the antioxidant activities of barley seeds extracts [91].

Ethanolic extract of P. microcephalum, M. oleifera, C. tiglium and G. globosa were examine for antioxidant, phenol and flavonoid content and spectrophotometrically determined. Aiyegoro et al., studied the aqueous extract of H. longifolium was explored for the secondary metabolites and antiradical activity [92]. Highest amount of antioxidant found in the plant extracts of M. oleifera consist of phenol, flavonoid content (Catechol, ascorbic acid and Quercetin), were studied for the DPPH. For a better assessment of the antioxidant activity of natural products is recommended. For 25 Bulgarian plants, ORAC and total phenolic content were investigated and compared. Nagulendran KR, Velavan et al., Cyperus rotundus rhizomes were studied for the primary and secondary metabolites and total phenolic content [93].

12 Natural medicine for the Natural origin was studied for the antioxidant and preliminary phytochemical studies. The antioxidant activity was executed by using tocopherol and butylated hydroxy toluene (BHT) as standard antioxidants.

Nagulendran et al., [94]. With Ferric thiocyanate (FTC) assay the antioxidant activity was compared with thiobarbituric acid (TBA)
method DPPH radical scavenging activity. Free radical scavenging activity was evaluated.

The overall antioxidant activity of *L. inermis* was more and followed in an inclined ordered by *Piper cubeba C. intybus*, *Camellia sinensis*, *P. granatum*, *A. sativum*, *D. regia*, *T. chebula*, *M. indica*, *O. sanctum*, *Terminalia bellerica* and *Trigonella foenum-graecum*.

Yen *et al.*, explained about the NO radical scavenging activity of *Uraria crinite* root and [95]. Seven plants, namely *O. sanctum T. chebula*, *P. granatum*, *M. indica*, *T. bellerica*, *C. intybus*, and *C. sinensis*, proved DPPH method. A fair relationship between radical scavenging activity and phenolic content was experimentally analysed in 9 plants *L. inermis*, *P. cubeba*, and *T. foenum* showed no such affiliation was experienced. Tested plant extracts showed capable free radical scavenging activity, to prove their conventional use.

Tai *et al.*, exposed antioxidant activity and responsible phyto constituents of *Sophora viciifolia* [96]. The curative plants were screened for free radical scavenging and superoxide anion scavenging properties using Rutin and Curcumin is high followed by the inclined order by *Hygrophilla auriculata*, *Delonix regia p. acerifolium*, *Datura stramonium A. aspera*, *Coriandrum sativum M. spicata*, and Five plants namely, *pterosperrum acerifolium*, *C. indica* *Achyranthes aspera, Mentha spicata*, *Delonix regia Cassia auriculata, Ocimum sanctum* showed brawny, super oxide anion scavenging activity. Both activities uttered as IC₅₀ and well-built relationship showed between total
polyphenolic contents in plants and their antioxidant activity. Sakanaka et al., worked on the Japanese persimmon leaf tea for antioxidant properties (Kakinocha-cha)[97].

The methanolic crude extracts of **Piper longum (Linn.)**, **Eclipta Alba (Linn.)**, **Amaranthus caudatus (Linn.)**, **Desmodium gangeticum**, **Ocimum sanctum (Linn.)**, and **Solanum nigrum (Linn.)** were studied for the activity by using ascorbic acid. Su et al., studied Pinus koraiensis seed extract for in-vitro and in-vivo activity of containing phenolic compounds[98]

The **D. gangeticum** antioxidant activity was found strongest, follow in downhill order by **E. Alba**, **A. Cadets**, **P. longum**, **Sanctum** [99].

Properties such as DPPH, total phenolic content, TEAC, total Flavanol content using reduced power method. Huang et al., studied on and total phenolic contents of wetland medicinal plants, in-vitro antioxidant properties [100].

According to the obtained results, different drying techniques affect unique bioactive compounds. Fresh herbs were characterized with the Niki E. evaluation of antioxidant aptitude in vitro and in vivo. [101]. The total phenol content of the analyzed plants ranged from 10.75mg GAE/g DM in microwave dried barge to 98.56mg GAE/g DM in freeze dried lemon balm. The highest content of total carotenoids was determined in fresh marigold (1.41mg/g DM), freeze dried borage contained the highest content of chlorophylls (7.67mg/g DM), while air-
dried borage contained the highest content of total anthocyanins (17.55mg/g DM). Gulcin et al., studied [102].

The effect of drying procedure on the pigment levels of three traditionally used medicinal plants was determined and the contribution of the pigment compounds to the overall biological potential of these plant species was examined. The contents of total phenols, anthocyanins, carotenoids and chlorophylls a and b were determined spectrophotometrically, in fresh lemon balm (*Melissa officinalis* L.), marigold and borage. Basing on the obtained results, different drying techniques affect different bioactive compounds. Fresh herbs were characterized with the peak filling of carotenoids and polyphenols, air-dried herbs exhibited total phenol content of the analyzed plants ranged from 10.75mg GAE/g DM in microwave dried barge to 98.56mg GAE/g DM in freeze dried lemon balm. The highest content of total carotenoids was determined in fresh marigold (1.41mg/g DM), freeze dried borage contained the highest content of chlorophylls (7.67mg/g DM), while air-dried borage contained the highest content of total anthocyanins (17.55mg/g DM), which is usually applied in the domestic preparation of natural herbal remedies.

The antioxidant properties and the total phenolic contents of thirteen vital curative plants were also described[128].

It is important in order to judge the antioxidant capacity and to determine the molecules. In this study, the antioxidant potency against the reactive species in the human body was identified. A wide difference
among the plant species, examine showed the absolute phenol and flavonoid content [129]. Electrochemical peaks detected by High Performance Liquid Chromatography were possible to access to flavonoids. A high percentage in selenolethionin was obtained from maderensis extracts. The hydroxyl scavenging capacity was detected and described by seleno compound and reported in the present work that it also shows the presence of peroxyl radical scavenging capacity. Polar extracts show high free radical scavenging activity. The plants show 92% values in the water extracts. In water extract the carotene-linoleic acid assay showed high antioxidant activity.

2.5. Antimicrobial activity

Dhar et al., [103,104] and Bhakuni et al., [105] assayed certain potential crude drugs based on bioassay studies. Antimicrobial activity of some selected plants was carried out by Verporte et al., [106]. Antibacterial and antifungal activity of Argintena folk medicines was conducted by Gutkind et al., [107] and Verporte et al., [106]. The crude drug extracts were bioassayed using pathological strains in order to evaluate the potential properties against the microorganisms. Das et al., [108], Ikram and Inamul [109] conducted a preliminary screening of some medicinal plants for antimicrobial activity.

Gary and Kasera [110] carried out as the antibacterial activity of the important oils of Sphareranthus indicus. Comprehensive data on the antimicrobial properties of Hungarian flora and Sudanese plants
were raised by Kulscar and Jenossy [11] and Almagboul et al., [112] respectively. Saxena and Vyas [113] conducted an antimicrobial screening of seeds of some ethnomedicinal plants. Antimicrobial activity of flavonoids extracted from certain medicinal plants was published by Barnabas and Nagarajan[114].

The bioactive compounds with antimicrobial principle like bicycles sesquiterpene lactone and dihydrosiscorine were extracted from petroleum ether extracts of *Dioscorea bulbifera* by Adeleye and Ikotum respectively and analysed the antifungal activitys. 176 crude plant extracts and 42 purified principles were recorded from 64 Indian medicinal plants by Naqvi et al., [115] for antibacterial, antifungal and anthelmintic effects. Antimicrobial activity of *Plumbago zeylanica* was carried out by Desta[116], while Caceres et al., [117] reported antidermatophytic properties of seven American plants used in the treatment of gastrointestinal disorders.

The antimicrobial properties of certain Indian medicinal plants were reported based on folklore information by Hook and Thomas [118]. Verma et al., [119] isolated a flavone glycoside, a potential bioactive compound from the leaves of Lamtana camara, which inhibited a wide range of gram positive and gram negative bacteria.

Lirio et al., [120] studied the antibacterial activity of aqueous extracts of 36 medicinal plants of the Philippines, while 34 plant species of folklore importance were bio-assayed and evaluated for
antibacterial activity by Perumal Samy et al.,[121,122]. The antibacterial activity of the acetone extracts of 6 selected Indian medicinal plants against Staphylococcus aureus and Escherichia coli were carried out by Rajendran et al., [123] while Raman et al., [124] studied the antibacterial activity of Cardiospermum hiaicacabum against certain plant and human pathogenic bacteria .

Screening of 82 traditionally used wild medicinal plants were subjected to preliminary antibacterial screening against pathogenic and opportunistic microorganisms by Ahmad et al., [125]. While Khan and Jabbar [126] assessed antimicrobial activity of Semecarpus anacardium against Escherichia coli using in vitro studies. Aqueous and alcoholic crude extracts of 37 Indian traditional medicinal plants were screened for antifungal activity against the pathogenic Candida albicans and dermatophytes by Mehmood et al., [127].

Preliminary screening for antimicrobial activities of methanolic extracts obtained from 35 Indian species was carried out by Minakshi et al., [128]. Gehlot, and Bohra [129] reported toxic effect of various plant part extracts on the causal organism of typhoid fever.

Antimicrobial activity of different solvent extracts of Acalypha indica leaves was conducted by Gopalakrishnan et al., [130] while, Perumal Samy and Ignacimuthu [131] and Srinivasan, et al., [132] reported with certain crude drugs from the Western Ghats. Mosaddik et al., [133] conducted antibacterial activity of methanol extracts of
Alangium salviforium flowers against both gram (+)ve and gram (-)ve bacteria.

Extract’s of Dichloromethane and methanol of 13 species of Alpinia, Costus and Zingiber (Zingiberaceae) genera were screened for antimicrobial and antioxidant activities by Habsah et al., [134]. Ahmed and Beg [135] conducted phytochemical and antimicrobial screening of ethanolic extracts of 45 Indian medicinal plants, while Bakshu et al., [136] reported the activity of Securing a leucopyrus Fitot against different pathogenic bacteria and fungi. Pharmacological activity of the methanolic extract of Cassia nigricans, the leaves were reported by Chidume et al.,[137].

Enzo et al.,[138] conducted antimicrobial activity of 56 ethanol extracts of Australian medicinal plants against four gram (+) viewings and four gram (-) the bacteria. Atalay [139] reported antiviral and cytotoxic activities of extracts from the cell cultures and respective parts of some turkish medicinal plants. The antimicrobial activity of methanol extracts of Urena lobata roots was studied by Mazumdar et al., [140], while Gupta et al.,[141] and Chowdhury et al.,[142] reported the antimicrobial activity of Terminally pallida (dried fruit powder) and Aerva lanata respectively.

Cos et al.,[143], studied the antimicrobial and antiviral activity of 45 medicinal plants against infectious and autoimmune diseases. Shafi et al., [144] reported antimicrobial activity of the essential oil isolated
from the aerial parts of Aristolochia indica, and leaves of Syzygium commune and Syzygium travancoricum. Bakshu and Venkata Raju [145] evaluated antimicrobial activity of essential oil obtained from the roots of Pimpinella tirupatiensis. Goutierrez-Lugo et al., [146] isolated three new antimicrobial cycloarta triterpenes from aerial parts of Acalypha communis. Wound healing properties of Heliotropium indicum, Plumbago zeylanica and Acalypha indicia have been reported by Reddy et al., [147]. Joshi et al.,[148] studied the antifungal activity of the stem bark of Ailanthus excelsa against five fungal strains. Antimicrobial activity of aqueous extracts, andrographolides and arabino galactan protiens of Andrographis paniculata was reported by Singha et al., [149].

The antimicrobial activity and chemical composition of essential oil of Chrysanthemum boreale was reported by Kim et al., [150]. Novel bio-active compound, 4-(2-propenyl)-phenyl angelate and four known phenyl propanoids were isolated by Tabanca[151] from Pimpinella species grown in Turkey.


Jeevan Ram et al.,[158] screened certain medicinal plants used for skin diseases, for their antimicrobial screening from Eastern Ghats. Resurreccion-Magno et al.,[159] and Amor et al.,[160] isolated antihyperglycaemic and spasmolytic flavonoids from Syzygium samarangense.


Zhu Shunying et al.,[164] deliberated the chemical composition and antimicrobial activity of the vital oils of three samples-fresh, air dried and processed flowers of Chrysanthemum indicum.
Christopher et al.,[165] screened 23 common herbal remedies used in South Texas to treat wounds and infections, for the antibacterial properties. Ana Cristina et al.,[166] reported antifungal properties of four Pterocaulon species used in ethnoveterinary medicine from Brazil. Antibacterial properties of ethanol extracts of nine Peruvian medicinal plants used in Calleria district (Czech Republic) were published by Kloucek et al., [167].

Chomnawang et al.,[168] evaluated antimicrobial effects of 13 Thai medicinal plants against acne-inducing bacteria. Antibacterial activity essential oil of the dried inflorescence of Cymbopogan nervatus, has been reported by El-Kamali et al., [169]. Kabouche et al.,[170] isolated bio-active three sterile and five diterpenoids from the acetone extract of the roots of Salvia jamiana.

Ewa-Witkowska et al.,[171] studied the antimicrobial properties of different extracts of Viola tricolor. Mandal et al., [172] isolated two saponins from Acacia auriculiformis and evaluated for their antimicrobial activity. Abiy and Yenesew et al.,[173] isolated antimicrobial flavonoids from the stem of *Erythrina burtii*. Madhavi [174] conducted antimicrobial properties of certain rare and interesting Euphorbiaceous medicinal plants from Kadapa district.

Krishnaveni et al., [175] antibacterial activity of fruit extracts of Solenum indicum by using alcoholic and chloroform extracts. Ganapathy et al.,[176] studied the antimicrobial activity of the
chloroform and methanolic extracts of leaf and stem bank of Vitex leucoxylon and Vitex altissima. while Saayi Krusha and Lakshmi Devi [177] studied the antimicrobial activity of crude aqueous extracts of unripe fruits of Aegle marmelos against a wide number of bacterial and fungal organisms by disc diffusion method. Parimala Devi et al., [178] studied the antimicrobial activity of methanolic extract of Cleome viscosa against various bacterial and fungal strains.

Steenkamp et al.,[179] studied the antimicrobial, anti-inflammatory and antioxidant properties of five herbal remedies used in the treatment of benign prostatic hyperplasia and prostatitis.


The above study includes the ethnobotanical inventory, preliminary phytochemical studies and antimicrobial assay of certain potential crude drugs. Two plants were selected for further processing of phytochemicals, which possess essential oil. The essential oil was
isolated and characterized by standard procedures explained in subsequent chapters. Kumar et al., [185] investigated the phytochemical and the antibiotic activity of *Hemidesmus indicus* var indicum in methanol extracts. Choudhery et al., [186] reported antifertility activity of the bark *Acacia nilotica*.

While Hemanth Kumar et al., [187] reported the antifertility activity of the fruit of *Ficus hispid* against *Setaria ceriv in vitro* by using alcoholic extracts. Das et al.,[188] studied the anti hypoglycemic effect of *Premna corymebosa* by using the ethanol extracts on albino rats. Susheela et al., [189] evaluated the hypoglycemic and antidiabetic effect or Melia Dubai fruit extracts on diabetic mice in a model. Baner et al., [190] evaluated on antibiotic susceptibility testing by standard single disc diffusion method.

Perusal of literature on medicinal plants of Anantapur district reveal that little work was done by earlier researchers. So, the present work was taken up to document some important medicinal plants and also to report some of the medicinal uses of plants in the area to report along with preliminary photochemical screening and antimicrobial assays.

### 2.6 Anthelmintic activities

Anthelmintic activity against Tubifex Tubifex and *Pheretima Posthuma* was screened with the methanolic extract of *paederia foetida*. The time of paralysis and the time of death of the two parameters which determined the concentration. The highest concentration of the extract,
i.e. 100mg/Lit was compared with piperazine citrate as university reference and distilled water control.

Infection with gastrointestinal nematode has severe consequences for the health of millions of people worldwide, and cause serious economic losses in livestock farming. Synthetic drug has been considered the most effective way of controlling parasite infections. But these drugs are expensive and sometimes unavailable to people and show the side effect, hence anthelmintic offer a simple, cheap, cost effective method of controlling parasites with no side effect. The purpose of this experiment was to study the anthelmintic activity of *Carica papaya* extract against *Ancylostoma caninum* in infection in mice.

Crude extracts of *Allium cepa* bulbs and *Elletatria cardamom* seeds show strong anthelmintic activity on *Pheretima Posthuma* (earthworm).

*Ixora coccinea Linn.* (Rubiaceae) is a bushy, rounded shrub found in the subtropical region of Florida. It was found out the petroleum ether extract (100 mg/ml) showed 62.33 and 78 minutes, water extract (100 mg/ml) showed 72.33 and 59.33 minutes, ethanol (100mg/ml) showed 79.66 and 90 minutes and chloroform with 83and 78 minutes for paralysis and death respectively compared to the Albendazole at the given experimental concentrations [140].

The aqueous extract of stem exhibited a noteworthy anthelmintic activity effect over other extracts at the given experimental concentrations.
Dose dependent activity was observed in both leaf and stem extracts, but leaves extract showed more significant activity than stem extracts. The present study indicates potential anthelmintic activity against Pheretima Posthuma in the leaf extract of the plant.

In-vitro anthelmintic activity for supporting their folklore use as traditional medicines. There are 30 plant seeds so far have been reported in the in-vitro anthelmintic activity. The families of plants have also been reported in which Fabaceae was found in most common plant family. Combretaceae, Meliaceae, Cucurbitaceae, Myrsinaceae and Anacardiaceae families were also noted possessing anthelmintic activity. The contemporary review also clears the picture about choosing the parasites which have been used for the activity. Ascaris Sp (35%), such as Ascaris lumbricoides, Ascaris suum etc., Ascardia Galli (29%), Tapeworm (18%), Earthworm i.e. Pheritima Posthuma (18%), Nippostrongyllus braziliensis, Haemonchus contours, Roundworms, Trichostrongylus colubriformis etc. have been reported as different targeted parasites for the evaluation of anthelmintic activity. This review on the plant seeds which have been used in anthelmintic activity will help in ethnopharmacology by evaluating the possible molecular level mechanism and isolation of active constituents by chromatography.

The purpose revealed in the above study was to determine the epidemiology of parasitic infections and the efficacy of treatment of kamela. Parasitic infections were supported by clinical and pathological
examination of the participants. Overall, helminthic infection in males is 70% higher than in females 30% by parasitic infection. Analysis of prevalence of socioeconomic factors revealed about 66.66% people affected are in the lower class the major contributing factor are poor hygienic conditions, poor sanitation and less awareness. In the study revealed kamela has shown better action against tape worm with a cure rate of about 96.67% as compared with thread worm 93.34% and round worm with a cure rate of about 86.67% respectively. kamela has shown effective in controlling the symptoms like pruritus ani, diarrhoea and history of passing worms with a cure rate of about 93.34% each. Other symptoms are also controlled like abdominal pain 80%, pruritus 86.67% and grinding teeth of 90%.

2-substituted benzimidazole derivatives were synthesized, purified and characterized by means of TLC, melting point, IR, \textsuperscript{1}H NMR, Mass spectral analysis respectively. The study is aimed at screening synthetic compound for anthelmintic activity. The anthelmintic activity of 2-substituted benzimidazole (2a-2d) compounds was measured for mean paralysis and mean death time.