

Medicinal Plant Resources of Rudrakod Sacred Grove in Nallamalais, Andhra Pradesh, India

B. Ravi Prasad Rao and S. Sunitha

*Biodiversity Conservation Division, Department of Botany, Sri Krishnadevaraya University,
Anantapur 515 003, Andhra Pradesh, India*

KEYWORDS Sacred Groves. Medicinal Plants. Tropical Forests. Nallamalais. Andhra Pradesh

ABSTRACT Rudrakod sacred grove, located in Nallamalai hill ranges of Southern Andhra Pradesh harbour rich plant diversity. The Chenchu tribal communities living in and around the sacred groves are endowed with rich traditional botanical knowledge pertaining to medicinal values of plant species. In the present study, we documented 69 vascular plant species of medicinal value used by the tribes. The paper deals with the systematic enumeration of the species with brief description, their distribution, phenology, local names, and medicinal uses along with mode of administration. Over-exploitation and unscientific collection of some medicinal plants threatening the resource and warrants sustainable harvesting by the local communities.

INTRODUCTION

The culture, faith and traditions of the local communities towards the natural resources conservation are gaining prominence over the years. The Global Biodiversity Strategy (Anon. 1992) and the National Biodiversity Strategy and Action Plan of India (Anon. 2000) highlighted the strengthening of research on ethical, cultural and religious issues related to biodiversity. The concept of sacredness attributed to environmental conservation can be observed at different scales and levels: sacred species, sacred groves and sacred landscapes (Ramakrishnan 1996). *Sacred groves*, the community based repositories of biological diversity are segments of landscape with typical geographical features, virtually represent a clump of trees associated with other forms of life, and affords protection on the basis of religious practice or faith. The groves are dedicated to a deity God, Goddess and it's a taboo even to cause a simple damage to life in the grove area. The groves are tending to be the fragments of original ecosystem and constitute unique examples of *in situ* conservation of genetic resources and serve as refuge for many

threatened and endemic taxa. Many sacred groves in India are known to harbour significant number of plants with medicinal value.

Hughes and Chandran (1998) have presented an overview of the distribution of sacred groves around the world. India, well known for its varied culture and traditions harbour a large number of sacred groves especially in northeastern India and Western Ghats (Malhotra et al. 1997). The groves were fairly documented in Maharashtra (Gadgil and Vartak 1981). Boojh and Ramakrishnan (1983) and Ramakrishnan (1998) highlighted the role of groves in environmental conservation. Andhra Pradesh, is reported to harbor over 800 groves and Southern Andhra Pradesh area (SAP) alone to 543 groves in a WWF preliminary study (Anon., 1996) in which both the authors are part of the investigating research team. Part of the WWF project, the author's team has done random survey in all the districts of SAP except Chittoor. Sunitha and Rao (1999) have done preliminary studies on the groves of Kurnool district. The sacred groves in the state were referred to *Pavithravanaalu* (Rao et al. 2001). One of the districts in Southern Andhra Pradesh, Kurnool is currently known with over 125 sacred groves (Sunitha 2002) and 40 of them were recognized as major groves. The study area, Rudrakod is one among them located in Nallamalai forests.

Several studies have been made on the medicinal plant resources of Andhra Pradesh. Important works include Rao and Hemadri (1979), Hemadri (2006), Kapoor and Kapoor (1980), Thammanna and Rao (1990), Rama Rao and Henry (1996), Pullaiah (2002), Jadhav and Red-

Address for correspondence:

Prof. B. Ravi Prasad Rao,
Member, Indian Subcontinent Plant Specialist Group,
Species Survival Commission, IUCN
Biodiversity Conservation Division,
Department of Botany
Sri Krishnadevaraya University,
Anantapur 515 003,
Andhra Pradesh, India
Phone and Fax: 08554-255019,
Mobile: 09440705602
E-mail: rao_rp@rediffmail.com

dy (2006), Bahadur et al. (2007), Prasad et al. (2007), NRSA (2007), Murthy et al. (2008). Rao (2010) presented brief profiles of over 200 medicinal plants encountered in Andhra Pradesh.

There are studies on tribal medicine in Andhra Pradesh. Reddy et al. (1988) surveyed the plants of Chenchu tribes of Andhra Pradesh. Krishna Mohan and Murthy (1992) have reported plants used in traditional medicine by tribals of Prakasam district. Kumar and Pullaiah (1999) studied ethno medicinal uses of some of plants of Mahaboobnagar district. Goud et al. (1999) enumerated about 29 species with the knowledge of tribals of Kurnool district for treating fever and malaria including *Andrographis paniculata*. Reddy and Subbaraju (2005) listed the crude drugs used by the tribals of East Godavari for common ailments. Goud et al. (2002), Pullaiah et al. (2003), Rajasekhar Reddy et al. (2006), Thulsi Rao et al. (2007) and Jeevan Ram and Raju (2007) studied different aspects on medicinal plants of Nallamalis and Kurnool part of Nallamalais has been studied for ethno-medicinal resources by Sudhakar Reddy et al. (2007). Shali Saheb (2008) studied the medicinal plants of Nallamalais and reported 501 taxa of which 137 are trees. Jayamma (2008) studied the NTFP resources of Bairlooty and Nagalooty forest areas which are the part of Nallamalais.

METHODOLOGY

Study Area

Rudrakod sacred grove is located in Nallamalai hill ranges of Southern Andhra Pradesh near Velgode (Fig. 1). Nallamalais is one of the Centres of Plant Diversity. The grove core area is extended over 5 hectares. The nearest village is Nallakaluva. The grove area is owned by temple trust and forest department. The forest is classified as tropical moist deciduous type. The soils are red sandy loam. There is a perennial spring near the sanctum sanctorum believed to have mineral and medicinal properties. The chief deity is Lord Rudrakoteswara. Annual jathara used to hold during Sivarathri. All tribal and non-tribal communities involve in the annual festival. There is a strong belief that the medicinal plants encountered in the grove area have the properties of medicinal plants of Himalayas.

Methodology

Rudrakod sacred grove was explored during 2001 and again in 2009. The plant taxa with medicinal importance were documented with the help of Chenchus endowed with Traditional Botanical Knowledge. The key informants are Jamal (age 50 years), Edanna (60), Mallaiah (55), Latchanna (45) who inhabit in a hamlet located near the sacred grove and two local herbalists: Gangi Reddy (65), Sankaracharya (70) and the temple priest, Krishna (60). Voucher specimens of all the plant taxa recorded with medicinal value were collected in quadruplicate samples and made into herbarium following standard methodology. The specimens were identified after a critical study and deposited in Sri Krishnadevaraya University Herbarium (SKU) at Anantapur.

RESULTS AND DISCUSSION

A total of 69 angiosperm species belonging to 66 genera and 36 families were recorded with medicinal value.

Medicinal Use Values of Species

Out of 69 plant species, *Aegle marmelos*, *Alangium salvifolium* and *Cocculus hirsutus* are having 6 medicinal uses followed by *Chloroxylon sweitenia* and *Calotropis gigantea* (5 uses). Nine plant species are recognised to have 4 medicinal uses. These include *Sterculia urens*, *Eclipta prostrata*, *Catharanthus roseus* and *Premna tomentosa*. Six plant species are recognised to have 3 medicinal uses.

Diseases Cured

A total of 67 diseases are known to cure by using 69 medicinal plant species. A maximum of 10 plant species are used as antidote to snake bite followed by 8 species for dysentery. Eight species are recorded to have healing properties (vulnerary). Seven species have antidiarrhoeal properties. Fever and skin diseases are known to cure individually by usage of 7 species. Five species are used to relieve from stomach disorders and urinary problems. Boils and blisters, diabetes and menstrual disorders are known to cure with the usage of 4 plant species. Only single plant sources are available to cure a maxi-

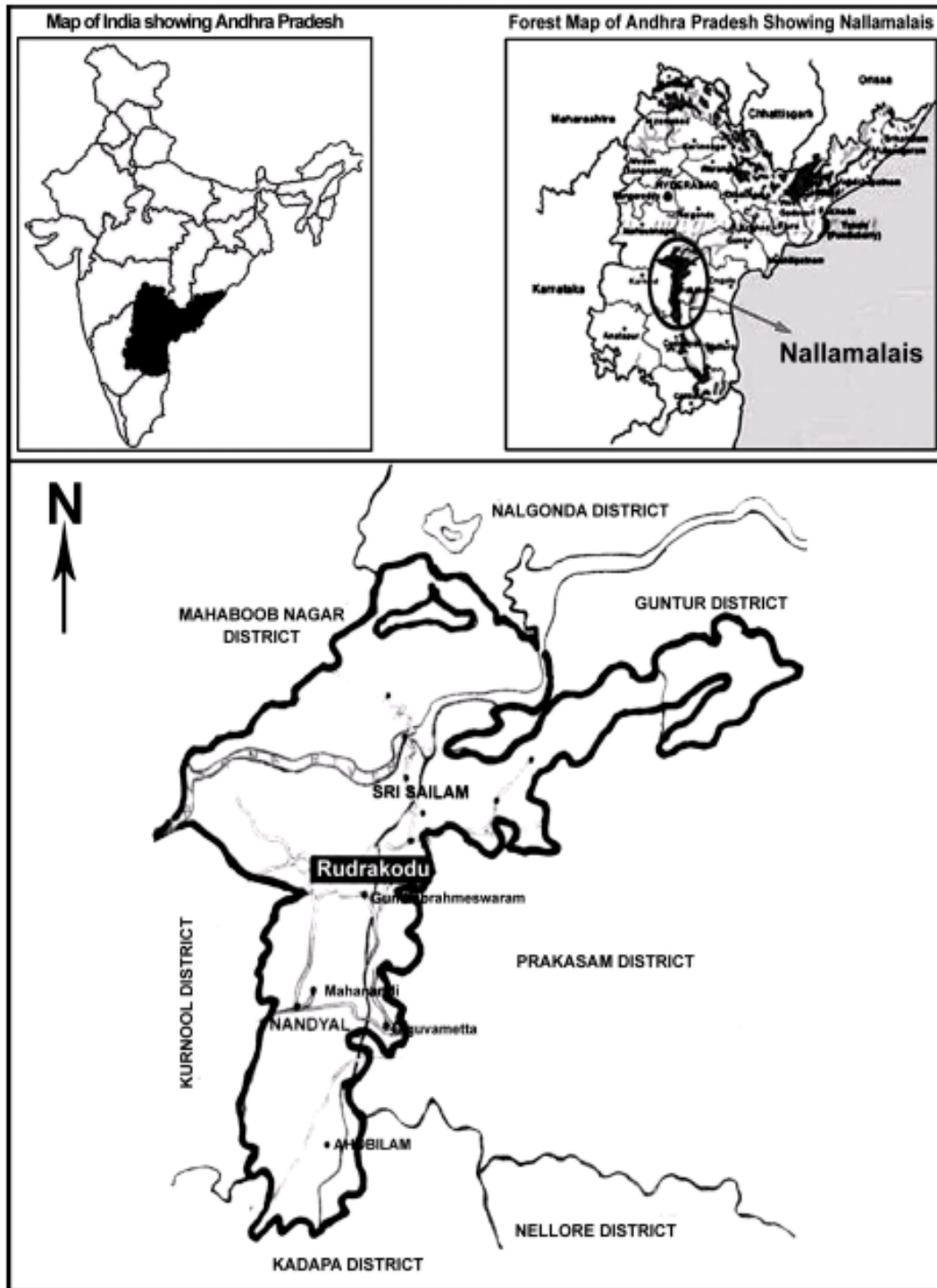


Fig. 1. Location map of Rudrakodu sacred grove in Nallamalais

imum number of 28 out of 67 diseases. These include the ailments like allergy, appetizer, bone fractures, eczema and leprosy. A total of 17 diseases are known to cure with 2 plant species individually. This includes abortifacients, refrigerants, purgatives, ulcers and urinary complications. Six diseases are covered by 3 plant species. A maximum of 4 plant sources are available for 5 diseases.

Plant Parts Used

Of all the plant parts, leaves are widely used to cure different diseases. Approximately 34% of the plant material used in different diseases is leaf followed by root / root bark accounting for about more than 22% and 16 % of the material is in form of stem / stem bark.

The taxa are systematically enumerated here-under following Bentham and Hooker's classification.

SYSTEMATIC ENUMERATION

MENISPERMACEAE

Cocculus hirsutus (L.) Diels

Climbing shrubs. Leaves ovate-oblong or sagittate, apex retuse. Flowers greenish-yellow, males in slender panicles, females in fascicles. Drupelets globose.

Common over bushes and small trees. Fl. and Fr.: All seasons. Vern. *Dusarateega*. Repr. Spec.: BR and SS, 21342.

Root powder mixed with other ingredients used for *rheumatism* and *stomach ache* in children. Stem powder mixed with camphor and taken internally to cure *diabetes*. Juice of leaves mixed with water is used as a cooling medicine in *gonorrhoea* and used externally for *eczema*. Entire plant is boiled and its decoction is given is promoting *menstruation*.

MALVACEAE

Abutilon indicum (L.) Sweet

Undershrub, to 1.5m. Leaves ovate-orbicular, deeply cordate, apex acuminate. Flowers solitary, axillary, yellow. Schizocarps depressed-globose with 12-20 mericarps.

Common. Fl. and Fr.: July – December. Vern. *Thuthurabenda*. Repr. Spec.: BR and SS 22412.

Root powder mixed in coconut oil is applied on the *leprosy symptoms* twice in a day until cured. Leaf juice mixed with jaggery and given orally to treat *scorpion bite*.

Sida acuta Burm. f.

Erect herb, to 75cm. Leaves ovate-elliptic, serrate, apex acute. Flowers creamish or yellow, axillary, solitary or in clusters. Schizocarps subglobose; mericarps 6.

Common. Fl. and Fr.: August – February. Vern. *Vishaboddi*. Repr. Spec.: BR and SS, 25801.

Roots as *antipyretic*; the infusion of root in conjunction with ginger is given orally thrice in a day for 3 days. Leaves as *antidysenteric* and *antidote* to snake bite; leaf sap is extracted by squeezing between the palms, mixed with honey and given in orally twice in a day.

Sida cordata (Burm. f.) Borssum

Erect much branched undershrub, to 1m. Leaves simple, cordate, serrate. Flowers solitary, yellow. Schizocarps globose; mericarps 5.

Common undergrowth. Fl. and Fr.: August-January. Vern. *Gayapaaku*. Repr. Spec.: BR and SS, 20003.

Leaf juice mixed with goat's milk is used for curing *paralysis*. Leaf paste is applied for *scorpion sting*.

Thespesia lampas (Cav.) Dalz. ex Dalz. and Gibson.

Undershrub, to 2m. Lower leaves palmately 3-lobed, upper ones ovate, entire. Flowers bright yellow with purplish black base, axillary, solitary. Capsules ovoid; seeds numerous.

Occasional. Fl and Fr.: September – April. Vern. *Adavipathi*. Repr. Spec.: BR and SS, 20177.

Dried leaf powder with pepper taken orally with water to relieve *stomach ache*.

Urena lobata L.

Erect woody shrub, to 1m. Leaves deeply lobed, crenate-dentate. Flowers pale pink with dark colour on the inner side. Fruit a globose schizocarp, seeds reniform.

Common. Fl. and Fr.: August – December. Vern.: *Nallabenda*. Repr. Spec.: BR and SS, 22583.

Root juice used as an external remedy for *rheumatism*. Decoction of leaves is used for treatment of *dysentery*.

BOMBACACEAE

Bombax ceiba L.

Deciduous tree, to 20m; trunk and branches with hard conical prickles. Leaves digitately 5-7-foliolate. Leaflets elliptic or ovate-lanceolate. Flowers bright red. Capsules sub-cylindrical, oblong.

Occasional. Fl. and Fr.: February-May. Vern. *Adaviburuga*, *Tellaburuga*. Repr. Spec.: BR and SS, 25802.

Root bark crushed with garlic and the extract is taken orally 2 teaspoonfuls once in a day for *menstrual disorders*. Stem bark ground with urine of infant and the paste is mildly heated and applied on *blisters*. Gum used as *refrigerant*.

STERCULIACEAE

Melochia corchorifolia L.

Erect herb, to 50cm. Leaves ovate-lanceolate, crenate-serrate. Flowers pinkish or white with yellow near the base, in terminal cymes. Capsules sub-globose, hispid.

Occasional. Fl. and Fr.: July–February. Vern. *Sittantakoora*. Repr. Spec.: BR and SS, 21265.

Stem and leaves are boiled in oil, a remedy for *water snake bite*.

Sterculia urens Roxb.

Deciduous tree, to 10m; bark whitish, papery, peeling off. Leaves palmately 3 or 5 lobed, cordate at base. Flowers greenish yellow in terminal panicles. Fruit follicle, 4 or 5 lobed, densely pubescent with stiff bristles; seeds dark brown.

Occasional. Fl. and Fr.: February-August. Vern. *Thellapoliki*, *Kovela*, *Thabbisu*. Repr. Spec.: BR and SS, 24914.

Stem bark ground with turmeric is administered for *rheumatic pains* and *ulcers*. Gum as refrigerant; gum dissolved in water given orally thrice in a day and also used to cure *dysentery*.

TILIACEAE

Corchorus aestuans L.

Annual, erect, much branched herb, to 70cm; sparsely pubescent. Leaves oblong-lanceolate. Flowers yellow in leaf opposed, short peduncled cymes. Capsules elongated, winged, beak 3-fid; seeds blackish-brown.

Common. Fl. and Fr.: August – January. Vern. *Parinta*. Repr. Spec.: BR and SS, 20242.

The plant ashes mixed with honey is used for obstruction of *abdominal viscera*. An infusion of the leaves used as *antipyretic*.

Grewia flavescens Juss.

Evergreen tree, to 6m. Leaves simple, oblanceolate, stellate pubescent below, crenate. Flowers yellow, in axillary cymes. Drupes globose, 2-lobed, wrinkled; nuts 2.

Common. Fl. and Fr.: August-December. Vern. *Tellajana*. Repr. Spec.: BR and SS, 22515.

Stem bark is used in *dysentery*. The wood powder acts as an antidote to *opium poisoning*.

Triumfetta rhomboidea Jacq.

Erect much branched, pubescent shrub, to 1.5m. Leaves broadly obicular, 3-lobed, upper ovate. Flowers yellow in terminal cymes. Capsules globose, greenish-brown; seeds 1-2 in each locule.

Common undergrowth. Fl. and Fr.: August-January. Vern. *Bankathuthara*. Repr. Spec.: BR and SS, 22624.

The root is used in *dysentery*. The bark and fresh leaves are used in *diarrhoea*

ERYTHROXYLACEAE

Erythroxylum monogynum Roxb.

Evergreen tree, to 3m. Leaves elliptic-ovate, entire. Flowers pale green axillary, solitary or in clusters. Drupes oblong-ellipsoid, red.

Common. Fl. and Fr.: June-December. Vern. *Devadari*, *Dadiri*. Repr. Spec.: BR and SS, 22629.

Leaf juice given orally as a *cooling beverage*. Leaf juice is administered for *jaundice*. Leaves crushed with black pepper and the extract is given orally to kill the *intestinal worms*. Stem bark decoction is used to treat *hiccup*.

RUTACEAE***Aegle marmelos* (L.) Correa**

Deciduous armed tree, to 12m. Leaves 3-foliolate. Flowers white in axillary panicles. Berries globose, seeds embedded in fleshy pulp.

Occasional. Fl. and Fr.: March-October. Vern. *Maredu*, *Bilva*. Repr. Spec.: BR and SS, 22545.

Stem bark ground with black pepper is used against *cholera*. Stem bark extract ground with jaggery is administered for *chest pains*. Leaf juice poured into nostrils for *cold*. Fruit pulp and stem bark decoction is taken internally with cumin seeds to treat *stomach disorders*. Leaf decoction used *antiasthmatic*. Fruit pulp mixed with honey or sugar is given for immediate relief for *hiccups*.

***Naringi alata* (Wall. ex Wight and Arn.) Ellis**

Armed tree, to 5m. Leaves 3-foliolate, petiole winged, leaflets obovate, base cuneate. Flowers creamish in axillary and terminal panicles. Berries globose.

Occasional. Fl. and Fr.: February-September. Vern. *Verrivelaga*. Repr. Spec.: BR and SS, 22699.

Stem bark is rubbed on a stone with water and the paste is applied at the site of *snake bite*. Fruit pulp is cooked with honey and taken orally twice a day for 3 days as *stomachic* and *stimulant*. Roots as *purgative*; roots are cut into pieces, boiled in water to get decoction and is taken orally thrice a day.

MELIACEAE***Azadirachta indica* A. Juss.**

Semievergreen tree, to 20m. Leaves imparipinnate; leaflets obliquely lanceolate, acute, cuneate, serrate. Flowers in axillary racemose panicles. Drupes oblong, yellow.

Occasional near temple. Fl. and Fr.: February-January. Vern. *Vepa*, *Yapa*. Repr. Spec.: BR and SS, 25804.

Leaf juice taken externally and internally to cure *skin diseases*. Leaf decoction taken with honey to cure *diarrhoea* and *dysentery*. Stem bark/root bark decoction is used to cure *malaria*.

FLINDERSIACEAE***Chloroxylon swietenia* DC.**

Deciduous tree, to 8m, wood yellowish. Leaves pinnate, leaflets oblong-lanceolate, gland-dotted, obtuse, entire, base oblique. Flowers white in terminal racemes. Capsules ovoid-oblong; seeds winged.

Common. Fl. and Fr.: March-August. Vern. *Billu*, *Billudu*. Repr. Spec.: BR and SS, 24491.

Root bark mixed with goat's milk is administered for *infertility*. Stem bark crushed with *Strychnos potatorum* is used for *epilepsy*. Stem bark paste is used for *scorpion-sting*. Gum dissolved in water is taken orally for *urinary disorders*. The smoke of burnt leaf is used as *mosquito repellent*.

RHAMNACEAE***Ziziphus xylopyrus* (Retz.) Willd.**

Straggling shrub, younger parts rusty tomentose. Leaves simple, ovate-elliptic. Flowers pale yellow in axillary and extra-axillary cymes. Drupes 3-loculed, ovoid, grey tomentose.

Common. Fl. and Fr.: April-September. Vern. *Gotika*, *Gotti*. Repr. Spec.: BR and SS, 22566.

Stem bark paste made into pills and taken orally against *cholera*.

ANACARDIACEAE***Mangifera indica* L.**

Large evergreen tree, to 30m. Leaves lanceolate. Flowers yellowish green in terminal panicles. Drupes fleshy, orange-yellow when ripe. Seeds solitary, compressed.

Often run wild. Fl. and Fr.: January-August. Vern. *Mamidi*. Repr. Spec.: BR and SS, 24991.

Stem bark made into powder and taken internally twice a day for 3 days to cure *post delivery pain*. Leaves with the stem bark and seeds of *Ricinus communis* are boiled in water and the decoction is taken orally thrice in a day for 3 days for *cough* and *asthma*. Resinous juice is mixed with the white of an egg and a teaspoonful of this mixture is taken orally thrice in a day for 3 days for *diarrhoea*.

FABACEAE-FABOIDEAE***Abrus precatorius* L.**

Woody twiner. Leaves paripinnate, leaflets linear-oblong. Flowers pink in axillary racemes. Pods oblong, pilose, wrinkled. Seeds scarlet with a black lateral blotch around the hilum.

Common. Fl. and Fr.: June-December. Vern. *Guruginja*, *Guruvinda*. Repr. Spec.: BR and SS, 20021.

Seed powder is used antidote to *snake bite*. Leaf juice/seed paste with goat's milk is used for *menstrual disorders*.

***Crotalaria prostrata* Rottl. ex Willd.**

Prostrate, hispid herb. Leaves elliptic-oblong, pubescent, rounded, base oblique. Flowers yellow in lateral racemes. Pods oblong-terete; seeds shining, 12-15.

Occasional. Fl. and Fr.: July-December. Vern. *Sangulugulla*. Repr. Spec.: BR and SS, 20196.

The root extract is used for *giddiness* – 2 spoonfuls twice a day till cure.

***Dalbergia paniculata* Roxb.**

Deciduous tree, to 15m. Leaves imparipinnate, leaflets oblong-obovate. Flowers pinkish-purple in long panicles. Pods lanceolate.

Common. Fl. and Fr.: April-September. Vern. *Pachaari*. Repr. Spec.: BR and SS, 24994.

Leaves are used as *discutient*. Tender leaves are warmed and placed on swellings and banded twice in a day till cured.

***Desmodium gangeticum* (L.) DC.**

Erect undershrub with spreading branches. Leaves ovate-lanceolate, acute. Flowers reddish-white in racemes. Pods jointed, hooked. Seeds reniform.

Occasional. Fl. and Fr.: September-December. Vern. *Gitanaramu*. Repr. Spec.: BR and SS, 20112.

Root extract of one spoonful is taken twice a day, till cure for *whooping cough*. Leaves ground with a pinch of salt and applied on *boils* and *blisters*.

FABACEAE-CAESALPINIOIDEAE***Bauhinia racemosa* Lam.**

Deciduous, tree, to 5m. Leaves, bilobed, cordate at base. Flowers yellowish-white, in terminal or leaf-opposed cymes. Pods falcate, compressed; seeds ovoid.

Common. Fl. and Fr.: April-February. Vern. *Aare*. Repr. Spec.: BR and SS, 24425.

Decoction of root bark is used for *antenatal complications* and *diarrhoea*. Stem bark is crushed and the filtrate mixed with goat's milk is taken orally for *epilepsy*. Two drops of tender leaf juice is poured into eyes for *ophthalmic infections*.

***Cassia fistula* L.**

Deciduous tree, to 5m. Leaves pinnate; leaflets glabrous, ovate, acute. Flowers yellow, in axillary racemes. Pods long, cylindrical, terete.

Common. Fl. and Fr.: April-September. Vern. *Rela*. Repr. Spec.: BR and SS, 22497.

The mixture of stem bark extract and the seed oil of *Scleichera oleosa* is taken two teaspoonfuls once in a day for three days for *chest pain*. The paste of the leaves and turmeric is used for *skin diseases*.

***Tamarindus indica* L.**

Evergreen tree, to 20m. Leaves paripinnate; leaflets narrowly oblong, obtuse at base and apex. Flowers pale yellow in lax racemes. Pods turgid, falcate.

Common around the temple. Fl. and Fr.: May-November. Vern. *Chinta*. Repr. Spec.: BR and SS, 24999.

Leaf paste is used as *abortifacient*.

FABACEAE-MIMOSOIDEAE***Acacia torta* (Roxb.) Craib.**

Straggling armed shrub. Leaves bipinnate. Flowers in globose heads.

Common in bushes. Fl. and Fr.: March-September. Vern. *Korinti*. Repr. Spec.: BR and SS, 24413.

A tea-spoonfull of leaf juice is given orally to children for *cough*.

COMBRETACEAE***Combretum albidum* G. Don**

Large climbing shrub. Leaves ovate-oblong. Flowers pale green, in axillary racemes. Drupes ovoid, winged.

Common. Fl. and Fr.: February-May. Vern: *Yadara theega*. Repr. Spec.: BR and SS, 24920.

The leaf paste is used to cure *wounds* and *cuts*.

MYRTACEAE***Syzygium cumini* (L.) Skeels**

Evergreen tree, to 20m. Leaves elliptic-oblong. Flowers white in paniculate cymes. Berries oblong, black.

Common along the stream. Fl. and Fr.: July-December. Vern. *Neredu*. Repr. Spec.: BR and SS, 25809.

Seeds are used for *diabetics*. Seeds are dried, powdered and a decoction of this powder is given half cup twice in a day for 15 days. One teaspoonful of seed powder is taken in orally with water, twice a day for *gonorrhoea* until cured.

LECYTHIDACEAE***Careya arborea* Roxb.**

Deciduous tree, to 15m. Leaves simple, obovate. Flowers yellowish-white, in terminal spikes. Berries globose.

Common. Fl. and Fr.: February-August. Vern. *Kumbi chettu*, *Gadava*. Repr. Spec.: BR and SS, 24478.

The mixture of stem bark and black pepper is made into an extract and the extract is mixed with curd in equal ratio and 5 teaspoonfuls are taken in orally twice a day for 10 days to cure *diarrhoea*.

LYTHRACEAE***Ammania baccifera* L.**

Erect herb, to 40cm. Leaves oblong-elliptic, acute, base cuneate. Flowers white in condensed axillary racemes or clusters. Capsules red when ripe.

Occasional in moist places. Fl. and Fr.: October-May. Vern. *Agnivendramu*. Repr. Spec.: BR and SS, 20187.

The plant is used to prepare a liniment, and applied as a remedy for *burning pain* in the eyes. Fresh leaves are used in skin diseases as a *rube-facient*.

ALANGIACEAE***Alangium salvifolium* (L.f) Wang.**

Deciduous tree, to 10m. Leaves oblong-lanceolate, ovate, base obtuse. Flowers white, in axillary cymes or clusters. Berries globose, creamish; seeds solitary, ovoid.

Common. Fl. and Fr.: February-July. Vern. *Vooduga*. Repr. Spec.: BR and SS, 24476.

The root bark is *antihelminthic* and *purgative*. The root bark powder is used in *fever* and *skin diseases*. Stem bark as *discutient*. The stem bark paste is applied at the site of *snakebite*, twice in a day until cured.

RUBIACEAE***Hedyotis puberula* (G. Don) Arn.**

Perennial ascending herb. Leaves clustered at nodes, linear-lanceolate. Flowers pinkish-white, in axillary umbels. Capsules globose.

Common undergrowth. Fl. and Fr.: Throughout the year. Vern. *Chiriveru*. Repr. Spec.: BR and SS, 25813.

Leaves as *antidote*. A cup of decoction from leaves, given in orally immediately after snakebite. Leaves as *antiasthmatic* and dried leaf powder is mixed with flour and made into cakes, two cakes are eaten each day for 15 days.

***Morinda pubescens* Smith**

Deciduous tree, to 20m. Leaves elliptic-ovate. Flowers white, in globose umbellate heads. Syncarpia globose, with 4-6 fleshy pyrenes.

Occasional. Fl. and Fr.: November-August. Vern. *Maddi*. Repr. Spec.: BR and SS, 22465.

Fresh stem bark is crushed and stained in a glass of water through out the night. The infusion is given in orally in the morning for 7 days for *jaundice*.

***Pavetta tomentosa* Roxb. ex Smith**

Large shrub, to 2m. Leaves elliptic-lanceolate, acute, base obtuse. Flowers white or greenish white in terminal corymbs. Drupes globose, black.

Common. Fl. and Fr.: June-November. Vern. *Katika papari*. Repr. Spec.: BR and SS, 21231

Leaves as *analgesic*. Leaves are beaten and squeezed through a thin cloth to get leaf sap, applied gently at the place of pain, thrice in a day for 3 days.

***Spermacoce hispida* L.**

Procumbent hispid herb. Leaves elliptic-lanceolate, leathery. Flowers pale violet or purplish in axillary whorls. Capsules septate between 2 mericarps; 2-seeded.

Common undergrowth. Fl. and Fr.: July-December. Vern. *Madana chettu*. Repr. Spec.: BR and SS, 22520.

The seeds are *aphrodisiac*.

ASTERACEAE***Ageratum conyzoides* L.**

Erect herb, to 80cm: pubescent. Leaves opposite, broadly ovate, hairy, crenate, acute, base truncate. Flowers pale blue in terminal heads. Achenes angled.

Common in moist places. Fl. and Fr.: Round the year. Vern. *Pumpulla*. Repr. Spec.: BR and SS, 24953.

The leaf paste is externally used for *cuts*.

***Eclipta prostrata* (L.) L.**

Annual prostrate or erect herb. Leaves lanceolate. Heads heterogamous, solitary, axillary or terminal with white florets. Achenes compressed with pappus.

Common in moist places. Fl. and Fr.: All seasons. Vern. *Gunta-galijaraku*. Repr. Spec.: BR and SS, 20247.

Stems and twigs are *odontralgics*. Leaves are squeezed in the fist to get leaf sap and a teaspoonful of sap is given in orally, thrice in a day for 15 days to cure *jaundice*. Whole plant in its fresh state is ground well, mixed with gingelly oil, boiled to get an ointment, applied externally at the symptom, thrice in a day for *elephantia-*

sis until cured. Whole plant as *antidepilatory* and plants are crushed to get sap and equal quantities of sap and coconut oil are mixed, boiled to get an ointment, massaged the scalp once in a day for 40 days.

APOCYNACEAE***Catharanthus roseus* (L.) G. Don**

Erect perennial herb, to 1m. Leaves elliptic-ovate. Flowers white or pink, axillary, solitary or in pairs. Follicles with cylindrical mericarps.

Often run wild. Fl. and Fr.: Round the year. Vern. *Billaganneru*. Repr. Spec.: BR and SS, 25820.

Roots are cut into pieces, boiled in water, filtered to get decoction, and is given in orally, at bed time for 3 days to reduce *blood pressure*. The plant is used for *diabetes*. The juice of the leaves is used as an application for *wasp stings*. An infusion of the leaves is used in the treatment of *menstrual disorders*.

***Wrightia tinctoria* (Roxb.) R. Br.**

Deciduous tree, to 10m, latex milky. Leaves opposite, elliptic-oblong. Flowers white, scented in terminal dichotomous cymes. Follicles paired.

Common. Fl. and Fr.: April-October. Vern. *Palvareni*. Repr. Spec.: BR and SS, 20300.

Mouth ulcers; A little cotton is dipped in the latex and applied on the mouth, thrice in a day for 3 days. Stem bark is used for *piles* and stem bark is cut into pieces, boiled in water to get decoction, a cup of decoction is given in orally, twice in a day for 10 days.

ASCLEPIADACEAE***Calotropis gigantea* (L.) R. Br.**

Shrubs, to 2m, latex milky. Leaves sessile, decussate, elliptic-oblong, base auriculate. Flowers white in terminal umbellete cymes. Follicles oblong, inflated; seed oblong with silky white coma.

Fl. and Fr.: Round the year. Vern. *Tellajilledu*. Repr. Spec.: BR and SS, 25821.

Roots as *vulnerable*; the dried roots are pulverised, boiled in coconut oil, made into an

ointment, and applied on wounds, thrice in a day until cured. Latex as *odontic*; collected from young floral buds are put in affected teeth, twice in a day for 3 days. Leaves as *antidote*, extract is mixed with pepper and administered internally after snakebite. Leaves as *analgesic* and *rubefacient*; thin layer of castor oil is applied on leaves, warmed on fire and bandaged for 3 days.

LOGANIACEAE

Strychnos potatorum L.f.

Deciduous tree, to 10m. Leaves elliptic, chartaceous. Flowers white in cymes on old wood. Berries globose, deep blue-black when ripe seeds 1 or 2.

Occasional. Fl. and Fr.: July-December. Vern. *Chilla*. Repr. Spec.: BR and SS, 21333.

Stem bark as *antidote* to snake; stem bark is crushed, boiled in water to get decoction is taken in orally, immediately after snakebite. Seeds are used for *boils*.

SOLANACEAE

Physalis minima L.

Erect, glabrescent herbs, to 60cm. Leaves elliptic-ovate, sparsely strigose. Flowers yellow, axillary, solitary. Berries globose with persistent calyx.

Occasional. Fl. and Fr.: June-December. Vern.: *Buddakakara*. Repr. Spec.: BR and SS, 24408.

Leaves as *vulnerable*; leaves and ginger are ground well to get thick paste, gently applied on tumours, twice in a day until cured. Roots as *diuretic*; roots are cut into pieces, boiled in water to get decoction; a cup of decoction is taken in orally for 3 days.

ACANTHACEAE

Elytraria acaulis (L.f.) Lindau

Acaulescent herbs, to 20cm. Leaves radical in close spirals, obovate, obtuse, crenate. Flowers white in axillary, slender spikes. Capsules oblong; many-seeded.

Common. Fl. and Fr.: Throughout the year. Vern.: *Eddu adugu*. Repr. Spec.: BR and SS, 20291.

Roots as *stomachic*; roots are dried in shade and crushed into powder; a teaspoonful of powder with a glass of water taken in orally thrice in a day for 3 days. Leaf paste is applied on *wounds* twice in a day until cured.

Indoneesiella echioides (L.) Sreem.

Erect herb, to 50cm. Leaves oblanceolate, decussate, acute, entire. Flowers white with purple tinge in axillary racemes. Capsules elliptic-lanceolate.

Occasional. Fl. and Fr.: August-December. Vern. *Nelavemu*. Repr. Spec.: BR and SS, 25830.

Root paste is applied for *toothache*. Leaf paste is applied for *skin diseases*.

Justicia betonica L.

Undershrub, to 1.5m. Leaves ovate-lanceolate, acute, serrate. Flowers greenish white with maroon streaks in terminal spikes; bracts and bracteoles leaf-like, membranous, white with green nerves. Capsules oblong.

Occasional. Fl. and Fr.: May-October. Vern. *Tellarantu*. Repr. Spec.: BR and SS, 21312.

Roots ground with a pinch of salt and the paste is massaged for *muscle pains* and 2 teaspoonfuls of the extract are given orally twice a day till cure. The plant is used for swellings and for *diarrhoea*. The leaves are used as poultice for *boils*.

Lepidagathis cristata Willd.

Procumbent herb. Leaves linear-lanceolate, pubescent, acute. Flowers creamish with pink tinge in condensed ovoid spikes crowded at the base of the stems. Capsules oblong, compresses; 2-seeded.

Common. Fl. and Fr.: September-March. Vern. *Mullabanti*. Repr. Spec.: BR and SS 20178.

The plant tonic is *antipyretic*. It is also applied to itchy affections of the skin.

VERBENACEAE

Premna tomentosa Willd.

Deciduous tree, to 15m. Leaves broadly ovate-cordate. Flowers creamish-yellow in axillary or terminal panicles. Drupes globose.

Common. Fl. and Fr.: August-December. Vern. *Naruva*. Repr. Spec.: BR and SS, 24489.

Roots as *antidote*; root is rubbed on a flattened rough surface with a little water to get a paste, applied on the tongue of the patient immediately after snakebite. The leaves are considered to possess *diuretic* properties and are used in *dropsical affections*. The leaf decoction is given after child birth for *labour pains*.

LAMIACEAE

Anisomeles indica (L.) O. Kuntze

Erect herb, wooly, to 1.5m. Leaves ovate, chartaceous, acuminate, crenate-serrate, base truncate. Flowers pink in axillary, dense spiked. Nutlets black.

Occasional. Fl. and Fr.: October-March. Vern. *Ada-beera*. Repr. Spec.: BR and SS, 20125.

The plant is *astringent* and *stimulant*. The oil from the plant is used in uterine affections. The leaves are grounded with turmeric powder and camphor and this mixture is put on the fire, the smoky fumes are inhaled for *cold*.

Leonotis nepetifolia (L.) R. Br.

Erect herb, to 2m. Leaves ovate, acute, deeply crenate, base truncate. Flowers orange-red in axillary globose verticillasters. Nutlets erect, trigonous. Seeds oblong.

Occasional. Fl. and Fr.: September-March. Vern. *Ranabheri*. Repr. Spec.: BR and SS, 20205.

The plant is used for *skin affections*. Ashes of flowers are applied to *burns*. The leaf decoction is taken orally for *fever*.

NYCTAGINACEAE

Boerhavia diffusa L.

Diffuse, ascending, much branched herb. Leaves ovate to oblong-lanceolate, acute, entire, base truncate. Flowers pink in axillary and terminal umbellate panicles. Anthocarps club-shaped.

Common. Fl. and Fr.: Throughout the year. Vern.: *Kanne komari*. Repr. Spec.: BR and SS, 25834.

Tuberous roots are used as *discutient*. Fresh tubers are ground well, boiled in water to get

decoction. One cup of decoction taken orally until cured. Root tubers as *aphrodisiac*; tubers are cooked and eaten along with goat milk, at bed time for 40 days.

AMARANTHACEAE

Achyranthes aspera L.

Erect herb, to 50cm. Leaves elliptic-obovate to orbicular, pubescent, base cuneate. Flowers pink or greenish white, in terminal elongate spikes.

Common. Fl. and Fr.: July-January. Vern. *Uttareni*. Repr. Spec.: BR and SS, 24970.

Leaves as *antifilariatic*; leaves, camphor coconut oil are mixed and ground well to get a paste, applied on the symptoms, thrice in a day until cured. Roots as *odontralgic*; teeth are brushed with fresh root, twice in a day, until cured. Seeds and leaves as *antidote*; seeds are dried and powdered; one teaspoonful is given orally immediately after bite.

Aerva lanata (L.) Juss.

Prostrate or diffuse herb, to 75cm. Stems and branches pubescent when young. Leaves elliptic-ovate, white wooly below, base tapering. Flowers white with pink tinge in axillary and terminal group of spikes.

Common. Fl. and Fr.: September-March. Vern. *Pindikura*. Repr. Spec.: BR and SS, 21347.

Roots as *diuretic*; roots are ground well, boiled in water to get decoction, a cup of decoction given orally thrice in a day for 3 days.

EUPHORBIACEAE

Euphorbia hirta L.

Erect or ascending hispid herb, to 60cm, latex milky. Leaves elliptic-ovate, serrate, cyathia greenish-red in axillary and terminal crowded cymes.

Common weed. Fl. and Fr.: Throughout the year. Vern. *Alumu*. Repr. Spec.: BR and SS, 25841.

Entire plant as *antidysenteric*; the plants are ground well, squeezed through a thin cloth, to get sap, one teaspoonful of sap is given orally twice in a day for 3 days. Latex is applied for *cuts* and *injuries* twice a day until healed.

***Euphorbia indica* Lam.**

Erect herb with milky latex, to 60cm. Leaves broadly oblong, obtuse, minutely serrate, base unequal. Cyathia in lax racemes, pink or greenish white with red tinge. Common. Fl. and Fr.: Throughout the year. Vern.: *Nanabalu*. Repr. Spec.: BR and SS, 21201.

An infusion of the dried leaves used in *dysentery*.

***Glochidion ellipticum* Wight**

Evergreen tree, to 8m. Leaves elliptic-oblong, glabrous on both surfaces, coriaceous. Male and female flowers mixed, greenish yellow. Capsules depressed globose.

Occasional. Fl. and Fr.: Throughout the year. Vern.: Chinni Usiri. Repr. Spec.: BR and SS, 21355.

Seed paste is used for *allergic complications*.

***Mallotus philippensis* (Lam.) Muell.-Arg.**

Deciduous tree, to 10m. Leaves ovate-lanceolate, glabrous above, pubescent below. Flowers yellow with red spots in terminal panicles. Capsules smooth.

Common. Fl. and Fr.: June-December. Vern.: *Kunkumapuvva*, *Sinduri*. Repr. Spec.: BR and SS, 21358.

Fruits as *vulnerable*; ground well with coconut oil to get a paste applied on wounds. Fruits as *vermifuge* - shade dried and powdered and one teaspoonful is taken orally with honey, twice in a day for 3 days.

***Phyllanthus urinaria* L.**

Erect herb, to 75cm. Leaves oblong, apiculate, ciliate, base obtuse. Flowers white, male in upper axils and female in lower axils. Capsules 3-valved, globose.

Occasional. Fl. and Fr.: July-December. Vern. *Erra usirika*, *Neeti usiriki*. Repr. Spec.: BR and SS, 20191.

The plant is considered to be an excellent *diuretic*. The juice of the leaves is given in coconut milk as an *appetizer* to children.

***Tragia involucrata* L.**

Twining herb with stinging hairs. Leaves elliptic-ovate to obovate, acuminate, serrate, base

truncate. Flowers greenish yellow in axillary and terminal racemes.

Occasional. Fl. and Fr.: September-April. Vern. *Duradagondi*, *Theetakalivenda*. Repr. Spec.: BR and SS, 20179.

The decoction of the entire plant is used as a powerful tonic in *fever* to reduce thirst, to arrest vomiting and to cure brain fevers and *nervous disorders*. Inhalation of the fine powder of the root cures *nasal bleeding*.

ULMACEAE***Holoptelia integrifolia* (Roxb.) Planch.**

Deciduous tree, to 12m. Leaves elliptic-ovate, pubescent, acute, entire, base rounded. Flowers greenish yellow in axillary fascicles. Fruits dry, winged, samara.

Common. Fl. and Fr.: October-April. Vern. *Tharisa*. Repr. Spec.: BR and SS, 25843.

Stem bark in paste form used as *vulnerable*.

MORACEAE***Ficus hispida* L. f.**

Evergreen small tree, to 5m, branches hispid. Leaves opposite, broadly oblong, coriaceous, scabrid above, hispid below, acute, base truncate. Figs depressed globose, grey - tomentose.

Occasional. Fl. and Fr.: March-July. Vern. *Bemmedi*. Repr. Spec.: BR and SS, 25846.

Stem bark extract mixed with pepper and taken orally 2-3 teaspoonfuls, once in a day for 5 days for *stomach ulcers*.

***Ficus racemosa* L.**

Tree, to 12m, aerial roots present. Leaves oblanceolate, glabrous, acute, base obtuse. Figs globose, white-pilose, purplish red when ripe, peduncled.

Common. Fl. and Fr.: April-December. Vern. *Medi*, *Athi*. Repr. Spec.: BR and SS, 22549.

A cup of latex collected from the roots is given orally thrice in a day for 3 days for urinary stones. Stem bark is as *antidiabetic*. Stem bark is cut into pieces, boiled in water to get an infusion. A cup of infusion is given orally for thrice in a day for 15 days. Young leaves are shade dried and powdered and a teaspoonful of powder, mixed with honey is given orally thrice in a day for 3 days for *bilious affections*.

***Ficus religiosa* L.**

Evergreen tree, to 30m. Leaves broadly ovate, coriaceous, shining, acuminate, entire, base truncate. Figs globose, axillary, paired.

Occasional. Fl. and Fr.: December-May. Vern. *Raavi, Ragi*. Repr. Spec.: BR and SS, 25847.

Root / stem bark extract mixed with buttermilk and taken orally 2 teaspoonful twice a day for 30 days for *paralysis*.

URTICACEAE***Pouzolzia zeylanica* (L.) Bennett**

Erect herb, to 50cm. Leaves elliptic-ovate, strigose, acuminate, entire, base rounded. Flowers white in axillary sessile clusters. Achenes 2-winged.

Occasional. Fl. and Fr.: August-February. Vern.: *Uchhagadda*. Repr. Spec.: BR and SS, 20198.

Roots as *diuretic*. A cup of decoction is given internally twice a day for 10 days.

ORCHIDACEAE***Vanda tessellata* (Roxb.) G. Don**

Epiphytes on large trees. Leaves channeled. Flowers brown, scented, sepals and petals tassellated on the inside.

Occasional. Fl. and Fr.: August-December. Vern. *Badanika*. Repr. Spec.: BR and SS, 21359.

The aerial roots and leaves are ground and paste in plastered for *bone fracture*, and the extract is given orally 5 spoonfuls twice a day until cured. Leaf juice is powdered and applied on *skin diseases*.

HYDOXIDACEAE***Curculigo orchioides* Gaertn.**

Slender tuberous herbs. Leaves radical, entire. Flowers yellow. Fruits oblong.

Occasional. Fl. and Fr.: June-November. Vern.: *Nelathati*. Repr. Spec.: BR and SS, 20134.

Raw tubers are eaten twice in a day for filarial swellings until cured. Tubers are also used as *aphrodisiac*. Root tubers are boiled in water

and eaten with milk twice in a day upto 40 days for potency. Roots are boiled in water and a cup of decoction is taken in orally for *gonorrhoea*.

DIOSCOREACEAE***Dioscorea wallichii* Hook. f.**

Prickly vine; tubers growing out directly from the base of the stem. Leaves opposite, ovate-orbicular. Male flowers in axillary and terminal panicles. Capsules broadly obovate, apex emarginate; seeds orbicular, broadly winged.

Rare. Fl. and Fr.: August – December. Vern. *Adavidumpa*. Repr. Spec.: BR and SS, 24915.

The root tubers are used by tribals as *deapetizer*.

COMMELINACEAE***Commelina benghalensis* L.**

Branched, diffuse herbs with dimorphic flowers. Leaves ovate to ovate-oblong, glabrescent. Aerial flowers blue in spathes; underground flowers white, cleistogamous.

Common. Fl. and Fr.: August-December. Vern. *Neetibotlu*. Repr. Spec.: BR and SS, 20008.

Stimulant; tender leaves are cooked and eaten with meal for a week.

POACEAE***Dactyloctenium aegyptium* (L.) Beauv.**

Ascending or decumbent herb. Leaf blades linear, acute, margin with tuberculate hairs; ligule ciliate. Panicle digitate. Spikes 3-5, spikelets sessile, secund, 5-flowered, glumes mucronate. Caryopsis reddish, subglobose.

Occasional. Fl. and Fr.: June-December. Vern. *Nelaragi*. Repr. Spec.: BR and SS, 20010.

Grains are parched and eaten by women, who suffer from *stomachache* after childbirth. Decoction of seed is used for kidney complications.

CONCLUSION

The present study on Rudrakod sacred grove clearly indicates the presence of rich diversity of medicinal plants. The collection of huge amount of plant material, especially roots and

bark, sometimes even the whole plant (in case of herbaceous plants) is questioning the very survival of many species of medicinal value. The unscientific tapping of gum of *Sterculia urens*, an important minor forest product of the study area has left many trees dead. Unsustainable harvesting of medicinal plants and large scale biotic interference during Sivarathri festival days is affecting the medicinal flora of the sacred grove. The sustainable harvest of these resources from grove area is need of the hour.

ACKNOWLEDGEMENTS

The authors are grateful to the Department of Science and Technology (SP/SO/A-40/98) and Department of Biotechnology (BT/PR6603/NDB/51/089/2005), GOI, New Delhi for providing financial support. Thanks are due to the officials of Andhra Pradesh forest department for according permission and cooperation.

REFERENCES

- Anonymous 1996. *Sacred and Protected Groves of Andhra Pradesh*. WWF- India, Andhra Pradesh State Office, Hyderabad.
- Anonymous 1992. *Venerated Plants*. Dehradun: ICFRE, Forest Survey of India.
- Anonymous 2000. *National Biodiversity Strategy and Action Plan – India, Guidelines and Concept Papers*. Ministry of Environment and Forests, Government.
- Bahadur, B, Janardhan Reddy, K, Rao, MLN 2007. Medicinal Plants: An overview. In: Janardhan Reddy K, Bir Bahadur and Rao MLN (Eds.): *Advances in Medicinal Plants*, Hyderabad: Universities Press, pp. 1-50.
- Boojh R, Ramakrishnan PS 1983. Sacred groves and their role in environmental conservation. In: *Strategies for Environmental Management*. Souvenir Volume. Lucknow: Department of Science and Environment of Uttar Pradesh, pp. 6-8.
- Gadgil M, Vartak VD 1981. Sacred groves of Maharashtra: An inventory. In: SK Jain (Ed.): *Glimpses of Indian Ethnobotany*. New Delhi: Oxford and IBH Publishers, pp. 279-294.
- Goud Sai Prasad P, Pullaiah T, Sri Rama Murthy K 1999. Native Phytotherapy for fever and Malaria from Kurmool Dist. Andhra Pradesh. *J Economic Taxonomic Botany*, 23(2): 337-340.
- Sai Prasad Goud P, Murthy K, Sri Rama, Pullaiah T, Babu GVAK 2002. Screening of Antibacterial and Antifungal Activity of some Medicinal Plants of Nallamalais, Andhra Pradesh, India. *J Economic Taxonomic Botany*, 26(3): 677-684.
- Hemadri K 2006. *Girijana vaidya sarvaswam (in Telugu)*. Vijayawada: Dr. K.Hemadri House of Tribal Medicine.
- Hughes JD, Chandran MDS 1998. Sacred groves around the earth: an overview. In: PS Ramakrishnan, KG Saxena, UM Chandrashekar (Eds.): *Conserving the Sacred for Biodiversity Management*. New Delhi: Oxford and IBH Publishing Co., pp. 1-15.
- Ramakrishnan PS 1996. Conserving the sacred: from species to landscapes. *Nature and Resources*, 32(1): 11-39.
- Rao RS, Hemadri, K 1979. *Andhra Pradeshlo Mandu Mokkalu (in Telugu)*. Hyderabad: Telugu Academy.
- Biodiversity Management*. New Delhi: Oxford and IBH Publishing Co., pp. 69-86.
- Jadhav SN, Reddy KN 2006. Threatened Medicinal plants of Andhra Pradesh. *ENVIS SDNP Newsletter, EPTRI*: 18-28.
- Jayamma K 2008. *Non-Timber Forest Products Inventory and Quantification-A Case Study from Nallamalais*. M.Phil Dissertation. Sri Krishnadevaraya University, Anantapur.
- Jeevan Ram A, Venkataraju RR 2007. Rare and little known medicinal plants from Nallamalais of Eastern Ghats, India. *Journal of Plant Sciences*, 2(1): 113-117.
- Kapoor SL, Kapoor LD 1980. Medicinal plant wealth of the Karimnagar district of Andhra Pradesh. *Bull Med Ethnobot Res*, 1: 120-144.
- Krishna Mohan R, Bhirava Murthy PV 1992. Plants used in Traditional Medicine by tribals of Prakasam District, Andhra Pradesh. *Ancient Science of Life*, 11(3-4): 176-181.
- Kumar Dharmachandra T, Pullaiah, T. 1999. Ethno-medicinal uses of some plants of Mahabubnagar Dist., Andhra Pradesh, India. *J Economic Taxonomic Botany*, 23(2): 341-345.
- Malhotra K, Stanley CS, Hemam NS, Das K 1997. Biodiversity conservation and ethics: sacred groves and pools. In: N Fujiki, RJ Macer (Eds.): *Bio-ethics in Asia*. Japan: Eubois Ethics Institute, pp. 338 – 345.
- Murthy GVS, Benjamin JHF, Bir Bahadur 2008. Medicinal plants of Andhra Pradesh. *Proc A P Akademi of Science*, 12 (1and2): 120-137.
- NRSA 2007. *Biodiversity Characterization at Landscape Level in Eastern Ghats and East Coast Using Satellite Remote Sensing and Geographical Information Systems*. National Remote Sensing Agency, Department of Space and Department of Biotechnology, GOI, New Delhi.
- M.N.V. Prasad, K. Padmalatha, K. Jayaram, N.L. Raju (India), Jaime A. Teixeira da Silva. 2007. Medicinal Plants from Deccan Ecoregion, India: Traditional Knowledge, Ethnopharmacology, Cultivation, Utilization, Conservation and Biotechnology-Opportunities and Impediments. *Medicinal and Aromatic Plant Science and Biotechnology*, 1(2): 155-208.
- Pullaiah T 2002. *Medicinal Plants of Andhra Pradesh*. New Delhi: Regency Publications,
- Pullaiah T, Murthy KSR, Goud PSP, Kumar TDC, Vijayakumar R 2003. Medicinal plants used by the tribals of Nallamalais, Eastern Ghats of India. *Journ Tropical Medicinal Plants*, 4(2): 237-244.
- Rajasekhar Reddy A, Mastan M, Naidu CV, Swamy PM 2006. A survey of medicinal plants in Nallamalai forests of Andhra Pradesh, India. *Proc AP Akademi of Sciences*, 10(2): 121-127.
- Rama Rao N, Henry AN 1996. *The Ethnobotany of Eastern Ghats of Andhra Pradesh*. Culcutta: Botanical Survey of India.
- Ramakrishnan PS 1998. Conserving the sacred for biodiversity: The conceptual frame work. In: PS Ramakrishnan, KG Saxena, UM Chandrashekar (Eds.): *Conserving the Sacred for Biodiversity Management*. New Delhi: Oxford and IBH Publishing Co., pp. 1-15.

- Rao Ravi Prasad B 2010. *The Plant Directory*. Hyderabad: Anantha Biodiversity Consortium-Dharani, Sri Kalanjali Graphics.
- Rao Ravi Prasad B, Reddy AM, Sunitha S 2001. Kurnool jillalo pavithravanalu, jeeva vaividya, samrakshana (in Telugu). *Anmadatha Sukhibhava*, 1(1): 19-20.
- Reddy KN, Gottumukkala V Subba Raju 2005. Ethnomedicine from Maredu Milli region of East Godawari Dist. Andhra Pradesh. *J. Economic Taxonomic Botany*, 29(2): 476-481.
- Reddy MB, Reddy KR, Reddy MN 1988. A survey of medicinal plants of Chenchu tribes of Andhra Pradesh, India. *International J Crude Drug Research*, 26: 189-196.
- Shali Saheb T 2008. *Medicinal Plant Resources and Conservation in Nallamalis, Andhra Pradesh*. Ph.D Thesis. Sri Krishnadevaraya University, Anantapur.
- Sudhakar Reddy C, Reddy KN, Thulasi Rao K, Pattnaik C 2007. Ethnobotanical studies on medicinal plants used by the Chenchus of Nallamalais in Kurnool district, AP, India. *Research Journal of Medicinal Plants*, 1(4): 128-133.
- Sunitha S, Ravi Prasad Rao B 1999. Sacred groves in Kurnool district. In: M Sivadasan, Philip Matthew (Eds.): *Biodiversity, Taxonomy and Conservation of Flowering Plants*. Calicut: Mentor Books, pp. 367-373.
- Thammanna, Narayana Rao K 1990. *Medicinal plants of Tirumala*. Tirupati: Tirumala Tirupathi Devasthanams.
- Thulasi Rao K, Reddy KN, Pattanaik C, Reddy CS 2007. Ethnomedicinal Importance of Pteridophytes used by Chenchus of Nallamalais Andhra Pradesh, India. *Ethnobotanical Leaflets*, 11: 6-10.