

A Study of Phytochemical Composition of a Few Tribal Medicinal Plants from Sriharikota

*R. Bharath Kumar and **B. Suryanarayana

*Associate Professor, Dept. Biotechnology, Vignana's Engineering College, Vadlamudi, Guntur-522213.
email: drbharathravuru@gmail.com

**Associate Professor (Retd.), # 8-307, Karnakamma Street, Venkatagiri Town -524132.
email: dr_bsnarayana@yahoo.com

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ABSTRACT

SRIHARIKOTA acquired importance botanically because of rich Island vegetation and due to installation of Rocket Launching Station by Indian Space Research Organisation (ISRO). A few Tribal colonies are domiciled there. Some aged tribal men conversed with herbal medicines and practices. With a fear that this tribal medicinal knowledge of the island may be lost, if urgently not pursued in a recorded manner for the benefit of modern society, a project on Ethnobotany and tribal medicines of Sriharikota Island is taken up three years back in 1996. Regular field tours are conducted covering all the seasons and about 300 medicinal plants are collected along with ample field notes on folklore medicinal uses with the support of local aged tribal men. Out of these, a few plants are selected on the basis of endemism and utility and subjected to phytochemical analysis. Investigation for 11 chemical components is made in 21 samples. All the data is recorded in this paper. The results are mostly in conformity with the medicinal uses and they are discussed.

Introduction

Yanadies an aboriginal tribe are in Sriharikota Island in Andhra Pradesh even after establishment of Rocket Launching Station. They are said to have been migrated from Malaya Peninsula, Africa or Australia.

Until the establishment of SHAR Centre at Sriharikota, yanadies used to live in forests and near sea coast in traditional way, drifted from the natural way of life due to agro-rural developmental activities a few aged tribal men are able to furnish 'ethno-medicinal data' pertaining to their traditional practices and healings. With the help of local tribal men, 300 ethnomedicinal plants are recorded. Based on their pharmaceutical uses they are classified into 16 – categories [Annexure II].

Out of 300 species surveyed 21 samples falling under 6 –categories are selected for phytochemical screening. Out of them 14 species are endemic/rare. The results are discussed in detail in this article.

Topography

Sriharikota Island geometrically is located at 800 .21' E and 130 .22' to 140 N. It is a spindle shaped land mass sandwiched between Bay of Bengal on the east and Pulicat lake on west. It is 18 km east of Sullurpet, the nearest Railway Station connecting Madras-Kolkata trunk line. Madras is 98 km away from Sriharikota.

Materials and Methods

Intensive medico-ethnobotanical survey is conducted in Sriharikota Island for 3 years since 1996-99. Field tours at regular intervals were conducted covering all the seasons so as not to miss seasonal elements having pharmaceutical value. Plants are selected for phytochemical screening are popularly used by tribals for their general ailments [Annexure 1].

Phytochemical screening was done by the standard procedures prescribed by Bhattacharya (1956), later modified by Chhabra et.al (1984) and Harborne (1973, 1977).

Preparation of Extracts

The plant parts (root bark, stem, leaf and whole plant etc.) were washed with water, chopped into small fragments and shade dried. The dried samples were ground to power (each 200 gr.) and stored in polythene containers at room temperature. These samples are used for screening to detect the different classes of chemical constituents. Extracts of sample are prepared by taking of 20 gr. of sample in 200 ml. methanol. Each sample is tested for 11 components Results are given in Annexure I.

16 Field tours of 5-7 days duration of each tour are conducted for three years during 1996-99. with the assistance of local tribal men. 300 species having medicinal uses and ample field notes also are collected regarding flowering, fruiting, flower colour and smell etc; phenological data. Further data pertaining to ethnomedicinal information of each species also recorded. 21 plant samples are chosen for phytochemical screening based on their popular pharmaceutical importance, coupled with their endemic or rare in occurrence. Active constituents present in the plant species in different plant parts (root bark, stem, whole plant, leaves etc.) are responsible for their therapeutic effects. A preliminary phytochemical analysis is conducted to detect the presence of alkaloids, saponins, tannins, carbohydrates, proteins, steroids, triterpenoids, amino acids etc., which act as possible curing agent during folk therapy.

Tests are conducted for 11 components as detailed in the Annexure-I. Their occurrence is noted with symbol (+) in the table given total number of components present in each sample is given in the last column (17) in parenthesis. The table also contains tribal medicinal uses and other folklore medicinal uses, so as to relate medicinal properties with the components of positive occurrence. Further these samples also grouped into 6 broad pharmaceutical categories as given in Annexure-II. Results of the tests for chemical constituents of each of the pharmaceutical group are discussed in detail, here under.

P.C. No. 5: RHEUMATISM AND ARTHRITIS

Seven test samples have PC 5 property based on their tribal /folklore medicinal use.

Upon chemical analysis five components viz. alkaloids, flavonoids, phenols, amino acids, steroidal nucleus are positive in variable combinations in 7 samples. Saponins occur in 4 samples, tannins occur in 2 samples. Presence of alkaloids, flavonoids, phenols, amino acids, steroidal nucleus in the samples consistently in variable combinations and minimum of two components positive for any 2 samples is indicative of having curative effect for PC 5 either individually or cumulatively

PC No. 7: SEXUAL PROBLEMS

4 samples positive for alkaloids (t 6)

Flavonoids (t 7), phenols (t 8), saponins (t 9) and steroidal nucleus (t 15) are positive for 3 samples out of 4 tested samples variably.

Thus alkaloids seems to have curative effect in combination with flavonoids, phenols, saponins and steroidal

nucleus for PC 7.

PC No. 8: SKIN & DERMATITIS

2 samples when tested, out 11 components resulted positive for four tests i.e., t 7, 8, 9, and 15 viz. flavonoids, phenols, steroids/triterpenoids and steroidal nucleus.

PC NO. 9: OPHTHALMIC & ENT

5 samples are reported for PC 9

All the 5 samples are positive for flavonoids (t7) where as 3 samples are positive in variable order for alkaloids (t 6), phenols (t 8), saponins (t 9) and tannins (t 10).

All the 5 components occur in 1 sample i.e., *Eugenia bracteata*.

Thus flavonoids (t7) seem to be curative component either individually as in *Capparis brevispina* or cumulatively in other samples.

PC No. 13: Cooling and Alterative

1 sample – *Colubrina asiatica* shown positive for t 7, t 9, t 13, and t 15.

PC No.16: Diabetes

1 sample tested for 11 components. Interestingly it is positive for 9 components. T 12 and t 16 are negative. Out of nine components which of them is specific curative is not certain for PC 16.

Annexure-II

PHARMACEUTICAL CLASSIFICATION

PC Category No.	Pharmaceutical Category [P.C.]	No. of Species Used
1.	Respiratory and Bronchial problems	--
2.	Cordiac	--
3.	Urinary and Kidney	--
4.	Piles and Constipation	--
5.	Arthritis and Rheumatism	7
6.	Anodyne elements	--
7.	Sexual problems	4
8.	Skin and Dermatitis	2
9.	Ophthalmic and E.N.T	5
10.	Psychoactive and Nervous	--
11.	Jaundice and Liver disorders	--
12.	Digestive and Stomachic	--
13.	Cooling and Alterative	1
14.	Antipyretic, Anthelmintic and Antiperiodic	--
15.	Antidotes and Antivenom	--
16.	Diabetes	1

Conclusion

21 Phyto-samples falling under 6 pharmaceutical categories are investigated for 11- chemical components. Results obtained are analysed to note that the presence of specific classes of chemical constituents are in conformity with the tribal medico-therapy, given in Annexure –II.

Further it is interesting to note that 14 samples out of 21 belong to endemic/ rare species. In view of Endemism/Rarity of the species chosen for phytochemical analysis, these specimens need further investigation to detect specific active principles of curative effect.

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TRIDALS OF SRITHARIKOTA ISLAND













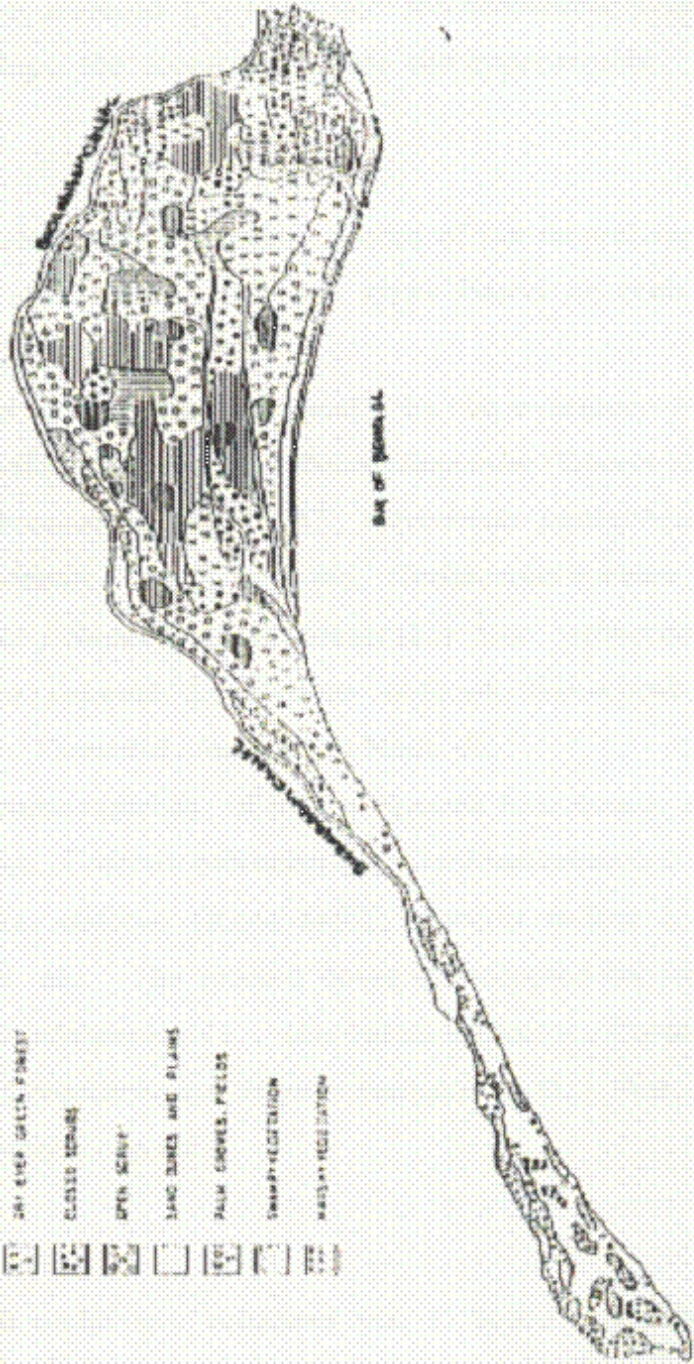
TRIBAL DOCTORS/VAIDYAS, SRITHARIKOTA



VEGETATION MAP OF THE FRENCHFRONT ISLAND



-  CASUARINA PLANTATIONS
-  EUCALYPTUS PLANTATIONS
-  SAGO PALM PLANTATIONS
-  DRY EVER GREEN FOREST
-  CLOSED SCRUBS
-  OPEN SCRUB
-  SAND DUNES AND PLAINS
-  PALM GROVES, FIELDS
-  SHRUBBY VEGETATION
-  BARELY VEGETATION



VEGETATION MAP - II

Annexure 1

PHYTOCHEMICAL SCREENING OF SOME SELECTED TRIBAL MEDICINAL PLANTS

Tribal Medicinal Plant species is about 19 no., with their crude drug samples 21 (leaf, Root, Root bark, stem, stem bark and fruit etc.) were tested against for 11 Phytoactive components (Phytochemical screening), which are widely present in various plant species their respective results are also given here. (*with their Phytoactive sample nos.)

S.No.	Bn., Ln., Family	Part used	Tribal uses in island	Reported other uses
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PC NO.5 ; ARTHRITIS AND RHEUMATISM :

1. <i>Breynia vitis-idea</i> Adavimunaga EUPHORBIACEAE	Lf.	Warmed with <i>Dalbergia paniculata</i> leaves and applied in rheumatic pains.	Leaves smoked like tobacco in swelled uvula and tonsils
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Phytoactive components are present in the drug sample/s: 1(+), 2(+), 5(+), 6(+), 7(+), 8(+), 9(+), 10(+), 11(+),
Total : 9.

2. <i>Clerodendrum phlomidis</i> Peddanelli/ Takkeda VERBENACEAE	Lf.	Warmed and applied for filarial and rheumatic swellings.	Leaf juice given in neglected syphilitic complaints.
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Phytoactive components are present in the drug sample/s: 1(+), 2(+), 5(+), 7(+), 8(+), 9(+), 10(+), 11(+)
Total :

8.

3. *Crotalaria laburnifolia* FABACEAE. Lf. Leaf paste with coconut oil applied Infusion of the Wh. plant for inflammation of the

mouth.

Phytoactive components are present in the drug sample/s: 2(+), 3(+), 4(+), 6(+), 7(+), 9(+), 10(+), 11(+),

Total : 8.

4. *Dalbergia paniculata* Pacchhari FABACEAE. Lf. Warmed, applied for rheumatic swellings and painful parts. —

Phytoactive components are present in the drug sample/s: 1(+), 2(+), 3(+), 6(+), 8(+), 9(+), 10(+), 11(+) **Total :**

8.

5. *Garcinia spicata* CLUSIACEAE. Rt.B Paste applied for pains and rheumatic swellings. —

Phytoactive components are present in the drug sample/s: 1(+), 2(+), 3(+), 4(+), 6(+), 7(+), 8(+), 9(+), 10(+),

11(+) **Total: 8.**

6. *Holoptelia integrifolia* ULMACEAE. St.B Warmed and applied on rheumatic swellings. Juice of boiled bark applied on rheumatic swellings.

Phytoactive components are present in the drug sample/s: 2(+), 5(+), 6(+), 10(+) **Total: 4.**

7. *Pisonea aculeata* NYCTAGINACEAE. Rt.B Leaves+Rt.B warmed and applied for rheumatic swellings. Bark and leaves used for swellings & rheumatic pains

Phytoactive components are present in the drug sample/s: 1(+), 3(+), 4(+), 5(+), 6(+),

10(+) **Total: 6.**

PC.No.7 ; SEXUAL PROBLEMS :

8. *Capparis zeylanica* CAPPARACEAE. Rt.B Used for treatment for janni (Post natal complications of ladies: fever accompanied with chillness). Cholera, stomachic and cholagogue.

Phytoactive components are present in the drug sample/s: 1(+), 2(+), 5(+), 10(+)

Total: 4.

9. *Crinum defixum* AMARYLIDACEAE. Bul. Scale leaves warmed and applied for swellings of testis. Emetic, diaphoretic used for treatment of the burns.

Phytoactive components are present in the drug sample/s: 1(+), 4(+), 5(+), 6(+) **Total: 4.**

10. *Hybanthus enneaspermus* Lf. Powder with turmeric Plant tonic,
 Ratnapurusha powder taken orally diuretic; leaves
 VIOLACEAE for general debility and tender sta-
 and vigor. lks demulcent.

Phytoactive components are present in the drug sample/s: 1(+),2(+),3(+),4(+),9(+), 10(+) Total:6.

11. *Linociera zeylanica* Rt. Paste taken orally in —
 Punagani case of sexual diseases
 OLEACEAE (syphilis, gonorrhoea)
 and menstrual problems.

Phytoactive components are present in the drug sample/s: 1(+), 2(+),3(+),10(+)Total:4.

PC.No.8 ; SKIN AND DERMATITIS :

12. *Pisonea aculeata* Lf. Leaf curry orally Juice mixed with
 Peetrinchi given to children pepper administe-
 NYCTAGINACEAE for mumps and red for pulmonary
 leprosy. complaints of children.

Phytoactive components are present in the drug sample/s: 2(+),3(+),8(+),10(+)Total:4.

13. *Ventilago madaraspatana* Rt.B. Paste applied for Juice remedy for
 Churidi/Surudu skin diseases. pains, and
 RHAMNACEAE. malarial fever.

Phytoactive components are present in the drug sample/s: 1(+),2(+),3(+), 4(+), 6(+), 7(+),8(+),9(+),10(+),11(+)Total:4.

PC.No.9; OPHTHALMIC AND E.N.T. :

14. *Capparis brevispina* Rt. Paste used in —
 Palasuri tooth ache and
 CAPPARACEAE infected gums.

Phytoactive components are present in the drug sample/s: 2(+) Total: 1.

15. *C. rotundifolia* Rt. Paste applied —
 Nagetimullu / incase of head
 Suramullu ache.
 CAPPARACEAE.

**Phytoactive components are present in the drug sample/s: 1(+), 2(+), 3(+), 4(+), 5(+)
 Total: 5.**

16. *Cymbidium aloifolium* Lf. Juice warmed and Emetic, purgative
 Thatisaga administered nutrient and
 ORCHIDACEAE incase of earache. demulcent.

Phytoactive components are present in the drug sample/s:2(+),4(+),5(+),8(+) Total:4.

*17. *Eugenia bracteata* Lf. Smoke used as —
 Kundanedu / mosquito repellent.

Kundaneredu
MYRTACEAE

Phytoactive components are present in the drug sample/s: 1(+),2(+),3(+),4(+),5(+),
6(+),7(+),8(+),9(+),10(+),11(+) **Total:11.**

*18.*E. bracteata* Rt. Paste mixed with —
Kundanedu / goat milk and
Kundaneredu applied for mumps.
MYRTACEAE

Phytoactive components are present in the drug sample/s: 1(+),2(+),3(+),4(+),5(+),
6(+),7(+),9(+),10(+),11(+) **Total:10.**

19.*Sarcostemma* St. Juice given to chil- Emetic, plant
acidum dren to get relief bitter, cooling.
Pulla teegalu from cold, Latex
ASCLEPIADACEAE dropped in eyes in
case of cataract
for remedy.

Phytoactive components are present in the drug sample/s: 1(+), 2(+), 3(+),6(+), 8(+),
9(+),10(+) **Total:7.**

PC.No.13 ; COOLING AND ALTERATIVE :

*20.*Colubrina* Lf. Juice taken as tonic. —
asiatica
Neetipulavachettu
RHAMNACEAE

Phytoactive components are present in the drug sample/s: 2(+), 4(+),8(+),10(+) **Total:4.**

PC.No.16 ; DIABETES :

*21.*Casearia* Rt. Decoction effective Promotes action
esculenta remedy for diabetes of liver. Decoc-
Kunda jungeru tion used in
SAMYDACEAE. diabetes and piles.

Phytoactive components are present in the drug sample/s: 1(+),2(+), 3(+), 4(+),5(+),
6(+), 8(+), 9(+),10(+) **Total:9.**

ABBREVIATIONS USED IN THE TEXT:

- 1.**Alka:** Alkaloids
- 2.**Flavo.:**Flavonoids
- 3.**Phen.:** Phenols
- 4.**Sapo.:** Saponins
- 5.**Tann.:** Tannins
- 6.**Carbo:** Carbohydrates
- 7.**Pro.:** Proteins

8.Stero./Triter.: Steroids/Triterpinoids

9.Amino.: Amino acids

10.Ster.Nuc. : Steroidal nucleus

11.Leu.antho.: Leuco anthocyanins

Total : Total Components

PLANT SPECIES : 19.

CRUDE DRUG SAMPLES : 21.

ABBREVIATIONS : St.: Stem, St.B: Stem bark, Rt.: Root, Rt.B: Root bark, Lf.: Leaf, Fr.: Fruit and
PC.No.: Pharmaceutical category number
Bn : Botanical name , Ln : Local name and
Fy : Family.

*: Endemic; r: Rare

COLOUR APPEARENCE : R: Red, Y: Yellow, B: Blue, G: Green, P: Pink
(or) Rose, M: Majanta (or) Crimson & V: Violet.

Plant samples extracts are prepared with methanol. (Universal solvent).

