

## DEPARTMENT OF HISTORY

### Brief Report on the Project on “Sri Aurobindo in Pondicherry”

Sri Aurobindo was an important Extremist leader having links with radicals. He was arrested in connection with Alipore Bomb Case and was later acquitted. He landed in Pondicherry on 4<sup>th</sup> April 1910. At Pondicherry he was received by Moni and Srinivasachariar and stayed at the house of Calve Shankar Chettiar. The early years of Sri Aurobindo in Pondicherry brought him in close contact with nationalists like Subramania Bharathi, Subramania Siva, V.V.S Iyer etc. In Pondicherry, Sri Aurobindo became an honorable guest of the French administration. He began to experience the spiritual vibrations and by October, 1910, Sri Aurobindo wrote that he had severed all connections with Politics. The first four years of his stay in Pondicherry was a period of ‘silent penance’. Pondicherry became the ‘Cave of Tapasya’ for Sri Aurobindo. The holy meeting of Mirra Alfassa, a French lady, with Sri Aurobindo happened on 29, March 1914. She settled in Pondicherry in 1920. When her Spiritual Mentor retired into seclusion after 24, November 1926, she founded the ‘Sri Aurobindo Ashram’ with a handful of disciples. Aurobindo started a philosophical monthly ‘Arya’ and his serious writings were published in it included ‘The Life Divine’, ‘The Synthesis of Yoga’, ‘Essays on the Gita’. “The Secret of the Veda”, ‘Hymns to the Mystic Fire’, ‘The Upanishads’, ‘The Renaissance in India’, ‘War and Self determination’ etc. His correspondence with his disciples was later published in three volumes entitled ‘Letters on Yoga’. His *magnum opus* Savitri, a legend and a symbol, is an epic poem.

## **Semantic features in Tolkappiyam Ezuththathikaaram**

**CICT (2014 -15) research project by Dr. P. Kolandasamy, Associate Professor of Tamil, KMCPGS, Puducherry.**

TOKAPPIYAM is the ancient thesis on Tamil grammar written by Tolkappiyar in 3<sup>rd</sup> BC. It has three divisions dealing with Tamil phonology, morphology and literary theories respectively. Each division has uniformly nine chapters. Tolkappiyar has illustrated the principles of semantics across the book not as separate entity but explicitly. Commentators have explicated the semantic features in Tolkappiyam. Hence to explore the semantic concepts, as a premier study, the first division namely EZUTHHATHIKAARAM has been taken for research.

The semantic features explored in Tolkappiyam Ezuththathikaaram and its commentaries are extracted as follow:

1. The classification of the phonemes as vowels, consonants and then short & long vowels according to their phonetic duration. In Tamil, short & long vowels are separate phonemes and making meaning difference.
2. In isolation phonemes do not denote meaning, but by changing a phoneme meaning of a word can be changed.
3. Supra segmental features such as intonation take semantic value.
4. In the language style of Tolkappiyar polysemous and hyponyms are found; they reveal the semantic pattern of ancient Tamil.
5. Tolkappiyar has employed many interpretative techniques to explain the grammatical concepts and the commentators have pointed out. The techniques have semantic value and they have been studied.
6. Morphophonemic rules and their semantic value have been interpreted and proper nouns, numerals have been explored.

The study may be first of its kind and a continuous process with an aim to establish the semantic pattern of Tamil Language & literature.

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Dr.S.A.VENGADA SOUPRAYA NAYAGAR, Associate Professor of French, KMCPGS.

Translation of Ainkurunuru, an anthology of 500 poems of Ancient Tamil Literature into French.

Ainkurunuru is one of the major anthologies of classical Tamil Language. Containing five hundred short poems, it is a part of Ettuthokai, an anthology of Sangam literature. This book contains verses written by five authors. These poems are compiled by Kudalur Kizhar at the behest of Chera King Yanaikkatcey Mantaran Ceral Irumporai. This anthology text consists of five sections. Each section consisting of 100 poems rendered by a poet is dedicated to one of the five landscapes(thinai) :

- 1 MARUTAM (100 Poems on Jealous Quarreling, by Ōrampōkiyār)
- 2 NEYTAL (100 Poems on Lamenting the Lover's Absence, by Ammūvaṅṅār)
- 3 KURIN̄CI (100 Poems on the Union of Lovers, by Kapilar)
- 4 PĀLAI (100 Poems on Separation, by Ōtalāntaiyār)
- 5 MULLAI (100 Poems on Patient Waiting for the Lover's Return, by Pēyaṅṅār)

The individual poems range in length from three to six lines. Dating to early third century, this classical Tamil work is considered as the oldest anthology of Tamil.

In this project of translation, a general introduction on the importance of this oldest anthology of sangam literature is given. The translation of each group of poems is preceded by a brief introduction. Translation of each poem consists of three parts. The original Tamil verse, accompanied by its transliteration and the translation of a poem. Poems are followed with needed footnotes such as botanical names of flowers.

Like most of our ancient literary works, the anthology of Ainkurunuru contains a series of information about the social, historical and cultural features of the Saṅkam age. They reflect the antiquity of Tamil civilisation, language and wisdom. In most of the poems, these aspects are referred to briefly.

Therefore, this translation would be useful to any French researcher interested in discovering the cultural heritage of Tamil. Besides, this venture would give a new insight into the process of translating a Tamil classical text into French.

**Dr. Mahipal Singh Shekhawat, Assistant Professor of Botany, KMCPGS, Puducherry.**

### **Brief Summary of Research Projects**

- 1. Department of Science, Technology and Environment, Govt. of Puducherry funded project:** Investigations on *In vitro* Regeneration of *Couroupita guianensis* Aubl. (Nagalingam Tree) –A Threatened but Medicinally Important Plant.

This study deals with the development of *in vitro* regeneration protocol for *Couroupita guianensis* Aubl. (Nagalingam tree/Cannon ball tree) using somatic tissues. It is a highly medicinal plant. Each and every part of this plant is used in all the types of systems of medicine in India. *Couroupita guianensis* is mentioned under threatened plants category in IUCN Red Data Book because the habitat of this species has been converted to agricultural land. The natural propagation of *C. guianensis* is very slow and seeds shown directly in the soil could not germinate. Hence, there is urgent need to develop a plant regeneration protocol to conserve this plant using biotechnological interventions. Fresh nodal shoot segments were found to be most suitable type of explants. These were sterilized with help of Bavistin and HgCl<sub>2</sub>. Three to five shoots were differentiated within 10 to 15 days from the each node. Maximum number of explants responded on MS medium (Murashige and Skoog) supplemented with 6-benzylaminopurine (BAP) where 57% explants regenerated shoots from the nodes. The effect of concentrations of Kinetin (Kn) on response of explants and shoot induction from nodal explants was not so impressive. The cultures were multiplied on MS medium + Indole-3 acetic acid (IAA) + each BAP and Kn at 25±2° C under 30 μmol m<sup>-2</sup> s<sup>-2</sup> Spectral Flux Photons (SFP). The most suitable medium for root induction from the *in vitro* raised shoots was found to be half strength MS medium + Indole-3 butyric acid (IBA). The rooted plantlets were hardened in green house in

bottles containing soilrite which were moistened with one-fourth strength of MS salts. Finally the hardened plantlets were transplanted in the field.

**2. University Grants Commission, New Delhi funded project: *In vitro* Regeneration of *Morinda citrifolia* L. and Characterization of Morindin Synthesis in Cultures.**

An improved *in vitro* propagation protocol for *Morinda citrifolia* L. by use of nodal segments as explants has been developed under this project. Murashige and Skoog (MS) medium was used to inoculate the sterilized explants. Under laboratory conditions,  $4.6 \pm 0.48$  shoots were regenerated from the nodal meristem of an explant on the combination of MS medium fortified with 6-benzylaminopurine (BAP). Semi-solid (with agar) and liquid MS medium was used for the multiplication of shoots *in vitro*. Combined effect of BAP and kinetin in shoot multiplication was reported favourable in semi-solid and liquid MS medium. The shoots were rooted *in vitro* on half-strength agar-gelled MS medium supplemented with indole-3 butyric acid (IBA) and 44.30 roots per shoot were observed from the cut ends of the shoots. All the shoots were also rooted by *ex vitro* method and maximum 36.12 roots per shoot were induced by treating the shoots with IBA. The *in vitro* rooted and *ex vitro* treated plantlets were transferred to the soilrite containing paper cups for hardening in the greenhouse. The plantlets were shifted to nursery bags after 4 weeks. Finally the hardened plantlets were planted in the field with 100% rate of survival under natural conditions. The *ex vitro* rooting was reported more advantageous than *in vitro* rooting in terms of cost, time and percent survival of plantlets. The morindone (red dye) was induced through the adventitious root cultures. The dye was enhanced, analyzed and characterized from the *in vitro* and *in vivo* grown roots and tissues.

- 3. Science and Engineering Research Board, Department of Science and Technology, Govt. of India funded project:** *In vitro* regeneration of critically endangered plant *Crinum malabaricum* Lekhak & Yadav and characterization of galanthamine in cultures.

*Crinum malabaricum* is a critically endangered medicinal plant with about 1000 plants available in a half Km<sup>2</sup> area in the Kerala state, India. The plant is a promising source of Galanthamine, an approved drug for Alzheimer's disease. The literary evidence is largely deficit at national and international level about the development of *in vitro* propagation methods to conserve this important medicinal plant from extinction. The present study is focused on development of efficient *in vitro* regeneration protocol to be used as conservation strategy and characterization and enhancement of Galanthamine contents using cells, tissues and adventitious root cultures of *C. malabaricum* to be used for the pilot scale production of the drug.

- 4. Department of Biotechnology, Govt. of India approved research project:** Foliar Micromorphological Studies at Subsequent Stages of Micropropagation of *Vanilla planifolia* Andr. using the Foldscope.

*Vanilla planifolia*, a species of vanilla orchid, is grown for its fruits in the Kerala, Tamil Nadu, Karnataka and North East states of India. The seeds of the vanilla pods are used to flavour ice creams, liquor, soft drinks, candies, pharmaceuticals, cosmetics, tobacco and handicrafts. Generally, Vanilla is propagated by the conventional method, *i.e.* using stem-cuttings. However, this method of propagation is inefficient, time-consuming and uneconomical. In order to meet the demand for propagules, rapid micropropagation of this plant is essential. Although, a number of researchers investigated *in vitro* propagation, including indirect organogenesis and direct shoots regeneration of vanilla but the success rate in survival of micropropagated plants under

natural soil conditions (*in vivo*) is very low (60% to 80%). The micromorphological studies could help in understanding the response of plants under changed environments and increase the survival percentage of micropropagated plants when these are transferred to the farmer's field.

UGC- Major Research Project  
Evaluation of Endophytic Actinomycetes as  
Antagonists of Agriculturally Important Fungal Pathogens.

F.No. 41-492/2012 (SR)/ Dated 16.7.2012.

Principal Investigator : Dr. T. Ganesan, Dept. of Botany, KMCPGS, Puducherry-8  
Amount: Rs. 10,08,000/-

In this investigation 64 plant species belonging to 32 families were used for isolation of endophytic actinomycetes. For each plant 100 plant bits were inoculated on starch casein agar, pH 7.2, and the plates were incubated for 30-60 days. While 48 plants yielded endophytic actinomycetes, no actinomycetes were isolated from 16 plants (*Andrographis paniculata*, *Acanthus ilicifolius*, *Heliotropium indicum*, *Ipomoea aquatic*, *Cordia monoica*, *Citrullus lanatus*, *Lespedeza thunbergii*, *Couroupita guianensis*, *Eugenia jamulona*, *Cocoloba uvifera*, *Tectona grandis*, *Ipomia aquatic* etc.). From the 48 plants a total of 255 actinomycete like colonies were isolated. Out of the 255 isolates 111 well sporulated isolates were screened for antimicrobial and plant growth regulatory activity against a panel of the following nine test organisms. a. Bacteria: Gram-positive bacteria (*Bacillus subtilis* & *Staphylococcus aureus*), Gram-negative bacteria (*Pseudomonas aeruginosa* & *Proteus vulgaris*), b. Fungi: Unicellular fungus: *Candia albicans*, Filamentous fungi: *Colletotrichum gloesporioides*, *Curvularia lunata*, *Fusarium solani*, & *Rhizoctonia solani*. Around 42% (n=47) isolates were found active to at least one test organism. Antibacterial activity was found to be prevalent (n=37) than antifungal activity (n=31). Only nine isolates exhibited both antifungal and antibacterial activity. None of the isolates showed any growth promontory activity. One isolate strongly inhibited seed germination and seedling growth. One isolate (En-28-8) with strong antifungal activity were selected for further study. Studies on optimization of antibiotic production by the selected isolate under the influence of pH, temperature, media composition- C & N source, and culture conditions were carried out. Biocontrol study in pot culture study protected plants from the infection of *Fusarium solani*. Endophytes are good candidates to control soil born fungal phytopathogens. There were also several endophytes with strong antifungal activity towards one or more fungal pathogens. Further work to screen endophytic actinomycetes of wild and medicinal plants may lead to isolation of novel isolates or with novel bioactivity.



**Project Details of  
Dr. Kumaresan V.**

Assistant Professor of Botany,  
Kanchi Mamunivar Centre for Postgraduate Studies, Puducherry.

**1. UGC Minor Research Project on “Diversity of gilled- fungi in Pondicherry”.**

Amount sanctioned – Rs. 1 lakh

Period – 2007-2009

Status: Completed

**Abstract**

Gilled-fungi or agarics or mushrooms mainly belong to the order Agaricales in class Basidiomycetes of Kingdom Fungi. They constitute one of the largest groups with around 10,000 species. This is the first report of agarics from Pondicherry. A total of 122 collections were made that belonged to 27 genera. Forty Nine species were described. Five new species have been proposed. One species is recorded for the first time from India. Five agarics species were brought to pure culture and have been deposited with IMTECH, Chandigarh.

**Genera of Agarics recorded from Pondicherry**

<b>Genera</b>	<b>No. of collections</b>	<b>No. of species</b>
<i>Agaricus</i>	20	6
<i>Bolbitius</i>	2	1
<i>Chlorophyllum</i>	2	1
<i>Conocybe</i>	4	2
<i>Copelandia</i>	2	1
<i>Coprinus</i>	6	3
<i>Crinipellis</i>	3	1
<i>Gymnopilus</i>	5	2
<i>Hohenbuehelia</i>	2	1
<i>Lactocollybia</i>	2	1
<i>Lentinus</i>	6	3
<i>Lepiota</i>	11	4
<i>Lepista</i>	3	1
<i>Leucocoprinus</i>	6	2
<i>Macrolepiota</i>	4	1
<i>Marasmiellus</i>	3	1
<i>Marasmius</i>	7	4
<i>Micropsalliota</i>	2	1
<i>Mycena</i>	2	1
<i>Pleurotus</i>	5	1
<i>Pluteus</i>	2	1
<i>Psathyrella</i>	4	2
<i>Psilocybe</i>	4	1
<i>Schizophyllum</i>	2	1
<i>Termitomyces</i>	9	3
<i>Trogia</i>	1	1
<i>Volvariella</i>	3	2
<b>Total</b>	<b>122</b>	<b>49</b>

## 2. Developing of Medicinal Plant Garden in Bharthidasan Govt. College for Women campus

(Amount sanctioned – Rs. 30,000/-)

Period: 2013-14

Sponsoring Agency: DSTE, Puducherry

Status: Completed

### Abstract

In India 6000-7000 plant species are estimated to have medicinal usage in folk and documented systems of medicine, like Ayurveda, Siddha, Unani and Homoeopathy. Medicinal plants are not only a major resource base for the traditional medicine & herbal industry but also provide livelihood and health security to a large segment of Indian population (National Medicinal Plants Board, GOI). The World Health Organisation (WHO) estimated that 80% of the population of developing countries rely on traditional medicines, mostly plant drugs, for their primary health care needs. Thus, there is an urgent need for preserving the medicinal plants before they are completely lost in the nature. Union Territory of Puducherry has large area falling under Eastern Ghats and has rich diversity of flora in patches of Tropical Dry Evergreen Forest along with medicinal plants. The present work was done to grow medicinal plants in college campus to enhance our knowledge on medicinal plant diversity in general and their occurrence in Puducherry, in particular.

A brief methodology for developing the garden:

1. Medicinal plant garden has been developed in an area of 46 x 19 sq ft in the college campus. This garden consists of 35 species of medicinal plants belonging to different families.
2. The soil in the area where the garden is developed was enriched with mixture of farmyard manure and river sand.
3. The seedlings of medicinal plants were procured from Perunthalaivar Kamaraj Krishi Vigyan Kendra and Pitchandikulam Bioresource Centre, Auroville.
4. The medicinal plant seedling have been planted with proper spacing.
5. For watering the plants drip irrigation method is being followed.
6. The plants have been named by placing name plates adjacent to the plants.
7. Some the medicinal plants include:
  - a) *Acalypha indica* L.
  - b) *Aloe vera* (L.) Burm.f.
  - c) *Andrographis paniculata* (Burm.f.) Wall. ex Nees
  - d) *Artabotrys hexapetalus* (L.) Bhandari
  - e) *Cheilocostus speciosus* (J.Konig) C.Specht
  - f) *Glycosmis mauritiana* (Lam.) Tanaka
  - g) *Kaempferia galanga* L.
  - h) *Plectranthus amboinicus* (Lour.) Spreng.
  - i) *Solanum trilobatum* L.
  - j) *Vitex altissima* L.f.

### **3. UGC Minor Project on “Macrofungal diversity of Puducherry and their Internal Transcribed Spacer sequence based molecular systematics**

Amount Sanctioned: 2.5 Lakhs

First Installment received: Rs. 1.75 Lakhs

Period: 2017-2019

Status: In Progress

#### **Abstract**

Macrofungi belong to two major group of fungi viz., Ascomycetes and Basidiomycetes, more species belonging to the latter. The studies with respect to macrofungi are meager. Therefore, this study will give insight into the diversity and on molecular systematics. Scientists have taken recourse to molecular techniques for identification (more specifically confirming the identification done by classical methods). Therefore, sequencing Internal Transcribed Spacer region gives the variations between species. Creating the ITS sequence database in this regard will be useful for future reference by any one working on the diversity of macrofungi. In mycology, sequences from the internal transcribed spacer (ITS) region of the nuclear ribosomal DNA are commonly used for the identification of fungi. Thus, ITS sequence database will be created that can be used by scientific fraternity working on the macrofungi, globally.

#### **Objectives**

- a. To study the diversity of the macrofungi in Puducherry.
- b. To prepare a photographic guide on macrofungi in Puducherry.
- c. To describe the macrofungi that are new reports to India and, species new to science.
- d. To develop a culture collection of as many macrofungi as possible and submission of cultures at the National culture collection center.
- e. To create Internal Transcribed Spacer (ITS) sequence database of macrofungi

The study is in progress. So far 61 collections of Macrofungi have been made and the identification process is in progress. Some of the macrofungi identified upto the genus level include: *Agaricus*, *Auricularia*, *Chlorophyllum*, *Daldinia*, *Ganoderma*, *Inonotus*, *Pisolithus*, *Xylaria* etc.

**DOCUMENTATION OF FISHERMAN'S TRADITIONAL KNOWLEDGE ON  
MEDICINAL VALUE OF FISHES**

Project outlay: Rs. 4, 50,000/-

Principle Investigator: **Dr.V.Ravitchandirane, Associate Professor of Zoology,  
KMCPGS.**

**ABSTRACT**

The primary data on traditional knowledge on medicinal use of fishes from the fishermen (above 60 years of age) and traditional practitioners of ethnic coastal villages viz kalapet, Solainagar, Thengaithittu and Veerampattinam of Puducherry region and Sothikuppam, Rasapettai, Samiyarpettai, Aarukattuthurai, Vedaranyam, Thondi and Thoothukudi of Tamilnadu regions have been collected through semi-structured and structured interview method with questionnaire, prepared based on the modified version of Foundation for revitalization of local health traditions (FRLHT), Bangalore. Simultaneously literature survey pertaining to this work was also done. A total of about 18 fish species have been identified as potential fishes and used either fully or partly in the treatment of various body ailments. In most cases the reported vernacular names have been identified with scientific names. Scientific classification and description of fishes with photographs of biomedically important species are established. Many species documented in this study are useful in the therapeutic in nature and are currently marketed and consumed throughout Puducherry and Tamilnadu regions. The most important fish species, with use-reports in the current century are reported. Palsura (Shark) stimulate the secretion of milk, Chumbarakah, Thimelai (Ray) relieve joint pain- arthritis, Katcha Karai (Silverbelly)- wound healing, Chunnambu Valai (Ribbon fish) relief for asthma problem, Konakuthirai (Sea horse)- useful for scabies. The fishes are documented using DNA barcoding. DNA sequences are analysed and established their evolutionary relationship through dendrogram.

### Policy Implications of the Study

The MGNREGS is a major new invention having potential to transform the rural socio-economic relations at micro-individual as well as macro-societal levels. However, the potential of the Scheme is still incipient and requires to be substantially supported in many different ways, since the very orientation of MGNREGA and the presentation of involvement in public works as a right is a new concept in rural India, which will take a long way to permeate, especially at the grass root levels. But everyone must understand that the MGNREGA may not be a long - term solution to the unemployment problem and economic well - being of rural India.

The success of the MGNREGA depends on mobilization of the poor, strong Panchayat Raj Institution System with proper institutional support and ensuring timely availability of funds etc. Many studies indicated low level of awareness among the unskilled workers and their inability to demand for the work. Further, some studies also indicated a sharp fall in rural-urban migration due to MGNREGS. Besides, few studies also revealed a positive impact of employment under MGNREGS on water availability, agriculture and livelihood of rural poor and recommended the need for maintenance of assets for better use in future. Hence, the present study is a maiden attempt to study the impact of MGNREGA on the economic well - being of unskilled workers in the Union Territory of Puducherry.

The objective of the study is to analyze the economic well - being of the unskilled workers after employed under MGNREGS and to analyze the difference in the age, gender and educational status with determinants of participation of unskilled workers in MGNREGS and the income and expenditure pattern of the unskilled workers employed under MGNREGS before and after employment in MGNREGS in the Union Territory of Puducherry.

The MGNREGS is the most significant Scheme to uplift the overall quality of life of rural households from the extreme poverty. The determinants of MGNREGA employment days identify the crucial factors for the successful implementation of the programme. The 'long delays' in wage payment must be minimized because such delay is not consistent with the provision of the MGNREGA.

Another issue is the provision of work when alternative employment opportunities are scarce; the MGNREGA has to fulfill the gap by providing extra employment days during the lean season. Gram Panchayat has to prepare proper shelf of schemes to explore different or

innovative works with new ideas. The overall awareness of the programme and information regarding the work should be widespread for better participation.

The MGNREGS workers are able to articulate their problems, as well as solutions related to MGNREGS very well in the household schedules as well as focusing on group discussions. However, the following are the suggestions put forth for implementation of the MGNREGS still better.

- ❖ **Increase the Number of Days of MGNREGS Work:** Fifty per cent of the unskilled workers have demanded that they should be provided at least 100 days of work. Half of them have demanded that the maximum number of days of work should be raised to 150 days. Hence, this may be considered as the rest of the days, after employed under MGNREGS, they are idle.
- ❖ **Increase the Wage Rate:** Another major demand is to raise the wage rate, as the work is physically challenging. A few number of women unskilled workers, who are aware of the revision of the minimum wages from R 100 to R 124 since January 2011, demand the revised minimum wage for MGNREGS works. It is noteworthy, at this stage, that currently there is no mechanism to inform the unskilled workers about such changes in the wage rate of MGNREGS. Hence, this has to be taken care of.
- ❖ **Worksite Facilities:** Another demand by the unskilled women workers is child care facility on the work sites. About one fifth of the unskilled women workers demand drinking water at the work site. Therefore, these demands may be considered positively.
- ❖ **Social Audit Programmes:** Delay in conducting periodic social audit programmes to judge the workings of the beneficiaries and to monitor the functioning of the Scheme is also a pitfall of the Scheme. Hence, it is suggested that the Scheme should ensure periodic social audit to assess the performance of the machineries involved in making the Scheme a vibrant and effective one.
- ❖ **Broadening the Understanding of Poverty to include needs of Women:** The Scheme could have a greater impact on poverty reduction and on development if there were broader understanding of the nature of poverty, especially the constraints faced by women. The Scheme needs to find further ways and means of improving its relevance to the daily lives of people (especially the women) and addressing ecological poverty, not just income poverty, through suitable modifications to the Scheme design.