



SPICE VISION

NEWS LETTER OF INDIAN SOCIETY FOR SPICES

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FROM THE PRESIDENT'S DESK

Dear Members of ISS,
Greetings!

Indian Institute of Spices Research (IISR) which was started as CPCRI Regional Station during 1975 has now completed 25 years and has contributed substantially for Spices Research and Development. The Institute is now celebrating the Silver Jubilee year (2000-2001). Birth of the Indian Society for Spices (ISS) is one such contribution of IISR and credit goes to all concerned. ISS, which was started during December 1990, has now completed 10 years of its existence and has played a commendable role for the cause of spices. Thanks to the collective responsibility shouldered by all the members which resulted in several important events like, National Seminar on Black pepper and Cardamom, 17-18 May 1992, Calicut; National Seminar on Post Harvest Technology of Spices, 13-14 May 1993, at Regional Research Laboratory, Trivandrum; National Seminar on Diseases of Spices, 7-8 April 1994, Calicut; National Seminar on Biotechnology of Spices and Aromatic Plants 24-25 April 1996, Calicut; National Seminar on Water and Nutrient management for Sustainable Production and Quality of Spices, 5-7, October 1997, at Madikeri, Karnataka; National Symposium on Spices, Medicinal and Aromatic Plants- Biodiversity, Conservation and Utilization, 10-12 August 1998, Calicut; Centennial Conference on Spices and Aromatic Plants 20-23 September 2000, Calicut, Kerala. The proceedings of all these seminars have been published by the Society and are available with Society. All these events were highly successful because of team work. These events benefited both the scientific and farming community.

ISS also was the co-sponsor of International Symposium on Plantation Crops, which was recently held at Hyderabad during 13-15 December 2000. As the President of the Society, I can assure you all that we will do our best to serve the cause of the Society—Improvement of spices overall to serve the cause of spices. We have recently taken decision that ISS will provide all necessary support for the Silver Jubilee Celebration of IISR wherein it is planned to have an interface of scientists with industry and farming community. During the current year we are also planning to bring out a cardamom guide for the benefit of the farmers. I place on record, the yeoman services rendered by the office bearers of the Society of yesteryears. We look forward for the support of all members in boosting up the Society to greater heights. We need your fullest cooperation, support and guidance from all concerned with spices in general. The President and executive committee members established an excellent rapport with sister associations serving the cause of plantation crops and spices. We look forward to meet you during the next general body meeting.

Thanking you all.


Y.R. Sarma
President, ISS

This issue of Spice Vision is sponsored by:

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New Director for IISR

Dr. Y.R.Sarma, distinguished Plant Pathologist and Former Head, Division of Crop Protection, IISR took over charge as Director, IISR, Calicut on 31st August 2000.

Dr. Y.R.Sarma is the founder member of Indian Institute of Spices Research, Calicut and obtained his doctorate (Ph.D) in Botany from Sri Venkateswara University, Tirupati. During the last 3 decades Dr. Sarma contributed substantially for spice crop pathology and is pioneer in developing ecofriendly biocontrol programmes for disease management in spice crops and has guided several students for their doctoral programmes in Calicut University. He had his postdoctoral training at University of California, Riverside, USA under the guidance of Prof. P.H.Tsao.

He established 'National network on Phytophthora diseases of Horticultural crops (PHYTONET)' with 9 centres throughout India and is the Network coordinator at present. He served as an Executive member for two terms on Phytophthora Committee of the International Society for Plant Pathology (ISPP). He served in the Biocontrol and Biofertilizers Expert Committees of Dept. of Biotechnology, and on several important panels at National level. He is the recipient of Dr. Puttarudraiah Endowment National Award for outstanding contribution to plant protection in India, Vasvik Industrial Research Award and Dr. C.S.Venkatram Memorial Award for Distinguished Scientist in Plantation Crops.

News from ISS

ISS General body met on 18 October 2000 during Centennial Conference on Spices and Aromatic Plants and elected the following members as Office bearers for the biennium 2000-2002.

President	- Dr. Y R Sarma
Vice Presidents	- Dr. V S Korikanthimath Mr. Koshy John
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Awards

Dr. C S Venkatram memorial award for distinguished scientists for the year 2000 was conferred on Dr. Y R Sarma, Director, IISR, Calicut for his life time achievements in plantation crops.

Dr. M N Venugopal, Sr. Scientist (Plant pathology) IISR, Appangala bagged Dr. J S Pruthi award for the best research paper published in the Journal of Spices and Aromatic Crops Vol. 8 (1999). The title of the paper is 'Natural disease

escapes as sources of resistance against cardamom mosaic virus causing 'katte' disease of cardamom (*Elettaria cardamomum* Maton)'.
 Mr. S S Mehta memorial award was jointly awarded to Sree Krishna Bhatt, Scientist and M R Sudharshan, Senior Scientist of ICRI Regional Station, Sakaleshpur for the best research paper (oral) entitled 'Effect of pollen load on growth and development of Vanilla (*Vanilla planifolia* Andr.)' presented in the Centennial Conference on Spices and Aromatic Plants held during September 20-23, 2000 at Calicut.

Mr. Alapati Prasada Rao Award was jointly awarded to Dr. B Chempakam, Principal Scientist (Biochemistry), Mrs. N K Leela, Scientist (Sr. scale) and Mr. Sinu P John (Research Associate) for the best research paper (Poster) entitled 'Distribution of curcuminoids during rhizome development in turmeric (*Curcuma longa* L.)' presented in the Centennial Conference on Spices and Aromatic Plants held during Sept. 20-23, 2000, at Calicut.

Silver Jubilee Celebration

The present Indian Institute of Spices Research was started on 10th November 1975 as a Regional Station of Central Plantation Crops Research Institute (CPCRI), Kasaragod with the mandate to indemnify research efforts on spice crops. During 1986, the centre was separated from CPCRI and the Indian Council of Agricultural Research gave an independent status and renamed it as National Research Centre for Spices. During 1995, it was further upgraded to the status of a National Institute and thus the present Indian Institute of Spices Research. This centre for Spices Research is completing 25 years of research on spice crops. The country witnessed vast development - be it spices production or research or developmental aspects, production of value added products or export etc. during the last 25 years. The IISR is planning to celebrate this happy occasion by declaring the year 2000-2001 as the Silver Jubilee Year. As a mark of celebration, the Institute is contemplating to have a spice community meet involving spice researchers (present and past), farmers and an interface with spice traders for free exchange of ideas. The other aim is to look for new avenues to increase spice productivity and to strengthen spices export through value added products. The institute is also planning to bring out a large number of publications during the occasion for the benefit of farmers as well as the spice workers. The actual celebration is fixed during 8-9 October, 2001. Padma Vibhushan Prof. M. S. Swaminathan, Chairman, MSSRF, Chennai, has kindly agreed to inaugurate. Indian Society for Spices is one of the proud sponsors of the Silver Jubilee celebrations.

Obituary

We mourn the sad and untimely demise of Mr. MSP Rajes, Chairman and Managing Director of MSP Plantations (P) Limited, Yercaud on 25 December 2000. He was the Life Member and Ex-Vice president of ISS. Our heart felt condolences to the bereaved family.

Traditional Knowledge - A successful Field Story

Ginger is an important but sensitive crop, gaining importance in Western Maharashtra. Ginger suffers from rhizome-rot caused by fungus and bacteria. A kitchen remedy, I tried, found effective against this serious menace of ginger in my plot is given below.

I made an emulsion of 1 kg jaggery, 10 kg cow dung, 10 L cow urine and diluted it to 200 L. The mixture was stirred daily once for a period of 3-4 days. This emulsion was used for spraying over an area of 0.1 ha ginger crop at fortnightly intervals. This resulted in healthy plant growth and provided protection against pathogenic fungus and bacteria.

I feel farmers should adopt this ecofriendly practice and avoid use of toxic pesticides so as to produce 'clean spice'.

P. Y. Dalvi
Satara
Maharashtra

Future threats of Black pepper – Virus and Phyllody

Phytophthora foot rot and slow decline continue to be the serious disease problems in black pepper. However, effective disease management technologies developed if properly implemented would be the answers. Hopefully the varieties resistant to these maladies might be a reality in short future.

The viral and phyllody diseases which are on increase in recent years might become future threats in black pepper, causing heavy production losses. Though these might have existed several years back, the research attention on these is just recent due to increased incidence. Stunted disease with symptoms of reduction in internodal length of stem, the leaves becoming leathery, brittle and small is caused by Cucumber Mosaic Virus (CMV) and mosaic/mottling/ interveinal chlorosis associated with 'Badna' virus (?) are spreading fast. Mixed infection by more than one virus is suspected. Though the aphids are the possible insect vectors, the insect transmission is yet to be established. Since the crop is vegetatively propagated and virus being systemic in nature, major mode of spread is through propagation of planting materials.

'Phyllody' is a systemic disease associated with 'phytoplasma' (earlier called as MLO). The affected plants gradually become sterile show severe foliar yellowing with malformation of floral buds to leaf like structures and affected branches exhibit 'witches broom' appearance. In either case (viral/phyllody) decline in the productivity is gradual and occasionally drastic.

How to control?

Appraise and educate the farmers about the symptoms of the maladies. At present avoid using shoots from infected vines as planting material. Uproot and eradicate the infected vines and replant with disease free rooted cuttings. These are the practical, simple and cheap methods.

Future : Molecular diagnostics and ELISA are to be standardized for an early detection of the disease in planting materials. Identification of vectors and their control and identification of resistant but productive cultivars of black pepper are the future priorities.

Y.R. Sarma & M. Anandaraj
Indian Institute of Spices Research
Calicut – 673 012, Kerala.

Medicinal Plants Around Us

Clerodendron infortunatum L.

Clerodendron infortunatum L. (Verbenaceae), known as 'Vattaperuvalam' or 'Oruveran' in Malayalam; 'Perugilai' in Tamil and 'Bhant' in Hindi, is a hardy shrub or rarely a small tree, very common to forest undergrowths, backyards, roadsides, neglected gardens etc. in the moist regions, up to 6000 ft. altitude.

The plant is characterized by ridged juvenile stem and branches and large terminal, white flowered, panicles of peduncate cymes. Leaves are dark green, entire, cordate, tomentose and edge serrated. Fruit is a fleshy drupe, black in an enlarged pink or rose calyx.

Clerodendron infortunatum leaves and root barks are credited with medicinal properties and biopesticidal activities. In the traditional medicinal system, the plant is used to treat coughs, skin diseases, tumours and as a vermifuge and expectorant. A strong decoction of the root bark is administered against severe dysentery, in the kitchen pharmacopoeia. In veterinary medicine it is used as anthelmintic. Aqueous extract of the leaves is effective against some pathogenic fungi and brinjal mosaic viruses affecting crop plants. Incorporation of the whole plants in cowdung pits arrests the breeding of rhinoceros beetle affecting coconut palms by suppressing the larval development.

Cabruvin and quercetin are isolated from the root bark of *Clerodendron*. The essential oil of the leaves and root bark

contain fatty acids (saturated and unsaturated) and their esters (palmitic acid), odorous monoterpenes like limonene, α -pinene, β -pinene, p-cymene, myrcene and sesquiterpenes such as β -cudesmol and caryophyllene.

B. Sasikumar

Indian Institute of Spices Research
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Scale Insects of Black pepper

Scale insects are small soft-bodied insects covered with a hard chitinous covering commonly called as scale. Scale insects have piercing and sucking mouth parts and feed on plant sap causing serious damage to many crop plants. The appendages of female scale insects are highly atrophied and they do not move but remain permanently fixed to plant parts. However, the males possess a pair of wings and superficially resemble cecidomyiids.

Black pepper is infested by various species of scale insects in India among which mussel scale (*Lepidosaphes piperis* Green) and coconut scale (*Aspidiotus destructor* Sign.) are more important. Scale insects are major insect pests of black pepper at higher altitudes (above 600 m MSL) especially in Wynad, Idukki (Kerala), Kodagu (Karnataka) and Nilgiris (Tamil Nadu) districts. The mussel scale is also sometimes serious on older cuttings and bush pepper plants in nurseries in the plains.

Mussel scales encrust the main stems of younger vines and lateral branches, mature leaves and berries. The pest infestation results in chlorotic spots/patches, yellowing and drying of leaves. Younger vines succumb to the pest during the course of 1-2 years especially when the infestation occurs in the main stems. On older vines the infested lateral branches wilt and dry resulting in vacant spaces in the canopy. Coconut scales infest leaves and very rarely stems of lateral branches and berries. The pest infestation results in chlorotic spots/patches on the leaves and their yellowing.

Adult females of mussel scales are elongated and dark brown measuring 3-4 mm in length. The eggs are white and are found under the scale cover of mature females. The larval stages last for 18-22 days. Adult females of coconut scales are circular and light yellow measuring 1.5-2.0 mm in diameter. The eggs are creamy yellow and the larval stages last for 10-12 days. Males of both the species are produced in large number during certain periods. Males do not live long or feed and die after mating. Both the species reproduce parthenogenically leading to a tremendous increase in population within a short period. The coconut scale is highly polyphagous and has been recorded on more than 20 economically important host plants in India. The mussel scale rarely infests other plants in the field. Rainfall has a deleterious effect on the population of both the species of scale insects and their population is generally considerably low during June-August (in Kerala). The population of mussel scale is higher during summer (February-May) months and that of coconut scale during the post monsoon and early summer months (September-February).

A number of predators and parasitoids have been observed feeding on both the species of scale insects in the field. Management with insecticides may not be necessary in the case of coconut scale since the available predators are able to suppress the field populations of scale insects.

Application of insecticides is essential for the control of mussel scale. It is important to initiate the management schedules during the early stages of pest infestation. Before initiating the management schedules, it is essential to prune and destroy severely infested lateral branches. Spraying of dimethoate 0.1% or monocrotophos 0.1% may then be undertaken on the infested vines. The spraying may be repeated after 21 days to control the infestation completely. The application of insecticides has to be done judiciously and may be avoided in case the berries are mature and are about to be harvested. Attempts to develop integrated management schedules against scale insects utilizing coccinellid predators, plant products and selective application of insecticides are in progress at Indian Institute of Spices Research, Calicut.

S. Devasahayam and K. M. Abdulla Koya
Indian Institute of Spices Research
Calicut – 673 012, Kerala.

Rice Bran - A New Source for Natural Vanillin

Vanillin is perhaps the most preferred flavour in ice creams, baked foods and beverages. We are not able to enjoy the true flavour of natural vanillin as our product is being exported to Western countries. We use synthetic vanillin, which is very cheap, to impart vanilla flavour to our foods. Now we can produce natural vanillin by biotechnological means. That too not from vanilla pods but from a waste material, rice bran.

Natural vanillin is usually extracted from vanilla beans. Freshly harvested vanilla beans do not possess the characteristic smell of vanillin as it is formed only during the 'curing' process, by the enzymatic degradation of ferulic acid. Rice bran is known to be a rich source of ferulic acid and microbial fermentation of ferulic acid yields vanillin. The vanillin so produced may be purified by micro filtration and active carbon treatment and it is proved to be identical with the vanillin isolated from vanilla beans in all respects. Here is a cheap source for the precious 'natural vanillin'. Let us enjoy it.

N.K. Leela

Indian Institute of Spices Research
Calicut - 673 012, Kerala.

Prawn Pickling

Pickles are now used as an important side dish. Pickling protects the food and helps to retain its wholesomeness and nutritive value for a long time. It is an ancient method to increase the keeping quality of food materials. When used as an adjunct to cereal and animal foods they make them very appetising and digesting. The following is a simple method for the preparation of prawn pickle.

Ingredients

Peeled and deveined prawn	- 1 kg
Chilli powder	- 135 g
Turmeric powder	- 20 g
Green chilli	- 50 g
Ginger	- 125 g
Garlic	- 100 g
Mustard	- 50 g
Vinegar	- 500 ml
Gingelly oil	- 250 ml
Sugar	- 5 g
Salt to taste	
Curry leaves	

Preparation

Mix the dressed prawn with some salt and keep aside for 1 hr. Fry it in minimum quantity of oil and set aside. Grind half the quantity of ginger, garlic and green chillies. The remaining half has to be cut in to small pieces. Fry mustard and curry leaves. Add finely cut green chillies, garlic and ginger. When it is slight brown in colour add the ground masala and fry it for some more time. Add chilli powder and turmeric powder and mix them nicely over a low flame. Add the fried prawns and mix thoroughly. Add vinegar and sugar and boil for 15 minutes. Cool the contents before bottling.

This product has a shelf life of more than a year. It is advisable to pasteurise the pickle before packing to extend the shelf life further. Pickles can be packed in rigid plastic containers or laminated pouches made of polyester (HDPE/LDPE) co-extruded films having moisture barrier.

Femeena Hassan

Indian Institute of Spices Research
Calicut- 673 012, Kerala

Paprika - A Potential Fascinating Spice

Chilli pepper is one of the important vegetable and spice crops. In India, it is an indispensable spice in every household. Chilli (red pepper) belongs to the family *Solanaceae* of the genus *Capsicum*. Chilli pepper ranks third, next only to black pepper and cardamom. Though introduced into India late in the seventeenth century, chillies have become an essential part of Indian cuisine and are valued for their characteristic pungency, colour, aroma and taste they impart to the food materials. 'Capsaicin' the pungency factor in chilli is an active counter irritant. The colouring matter of chilli is ascribed to capsanthin - a carotenoid pigment. Paprika pods are the richest of all sources of ascorbic acid.

The large fruited, non-pungent capsicum - 'paprika' is the term used by International Spice Traders for the red capsicum powder - has a great commercial importance. It is used both in the form of powder and oleoresins.

American Paprika, Spanish paprika and Hungarian paprika are the leading paprika types traded in the world market.

American paprika : South Western states of America have been the major suppliers of paprika to the American market. The paprika is scientifically and mechanically dried for stability and retention of maximum colour extraction value.

Spanish paprika : Spain produces a sweet pepper in a wide range of colour values. Presently, Spain is selling paprika on the basis of ASTA units of extractable colour.

Hungarian paprika : Hungary was the USA's second supplier of imported paprika. Hungarian paprika has a distinctive flavour and is always in great demand in Europe, where it is used as a seasoning and colouring agent. Brazil, Bulgaria, Morocco, India, Italy and Yugoslavia are the other paprika producers and exporters in the world.

Paprika peppers are selectively bred for colour and flavour. These factors can be controlled to a certain extent by processing. The seeds and veins have negligible red colour. Low yield is a limiting factor for paprika production.

Paprika breeding is very recent to India. The Regional Research Vegetable Station at Katrain (H.P.) and Indian Institute of Horticultural Research (IIHR), Bangalore have developed a few paprika varieties for cultivation which include Kt-P1-19 and Arka Abir.

In India, paprika can be grown in the states of Andhra Pradesh, Karnataka, Maharashtra, Madhya Pradesh and Gujarat. Capsicum fruits with many levels of pungency / colour combinations are available in India, which can be successfully used to breed suitable lines for the different agroclimatic regions. Among them Warangal (A.P) tomato chilli is the one which is a source of high colour value with low pungency. The Byadagi chillies of Dharwad district of Karnataka is a rich source of colour value with low pungency. Research on paprika has been initiated at Indian Institute of Spices Research, Kozhikode with an objective of evolving suitable varieties for Kerala conditions.

K.P.M. Dhamayanthi

Indian Institute of Spices Research
Calicut- 673 012, Kerala

Dr. Pruthi's column

Post Harvest Technology of Spices-I

(Continued from the last issue)

Fine cleaning and grading machines

1. Plain Graders

These are without aspiration systems. They are built as i) Flat Horizontal Decks Type with reciprocating motion, or as ii) Cylindrical Drum type with Rotary motion, or as iii) Flat Inclined Decks Type with Gyrotory motion. In these machines selection of sieve sizes are precise. Suitable sieve cleaning device is important as close grading of seeds creates choking of sieve openings.

2. Fine cleaners-cum-Graders

These are mostly horizontal, inclined, flat types, multi-deck machines provided with pre-aspiration and post-aspiration to remove fine matter by pre-cleaners. These machines are built with fine controls for feed rate, air – flow, inclination of deck, speed, speed of vibrations and amplitude, in addition to having sieve-cleaning devices to individual deck. These machines are called 'sifters' also.

3. Indent cylinders

These are rotary type machines provided with specially indented cylinders, to the given seeds to separate on the basis of length. Hence they are also called 'length graders'. They have in-built multi-cylinder machines also. Indent sizes decide the grade of the seed by length.

Finishing Machines

1. Destoner

This machine consists of vibrating single flat deck air system. If the cleaned product after fine cleaning and grading is left with product size, heavy impurities like stones, mudballs, metal pieces, pebbles etc., destoners are used to separate these heavy contaminants. 'Vacuum type' destoners with aspiration system are better equipped for dust-free plant operation as compared to the 'pressure-type' destoner of open design. These machines are provided with fine controls on air, feed inclination of deck, thrust to the deck and speed.

2. Gravity separator

This machine consists of a 'vibrating flat-deck', in triangular construction and air system, whereas destoner provides facility for two separations. The gravity separator is a more elaborate machine providing multiseparations (Three to five separations). This machine is widely used to remove light/shriveled/wrinkled seeds and retain bold and heavy varieties of seeds and grains. The product obtained is more than 99 percent pure.

This machine also has 'built in vacuum' with aspiration system as well as pressure type in open construction. It is provided with many controls, which require a skilled operator to adjust for optimum performance of the machine. These adjustments are air, feed, speed and long side inclination and cross side inclination of deck.

(To be continued)

The ISS Family-Know Your Family Members

(Continued from the previous issue)

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