

Feature

Rice-fish Farming Makes a Comeback in Asian Countries

THE traditional practice of rice-fish farming, or the raising of fish in rice paddies, is making a comeback in Asian countries. Throughout the world, the technology is being revived through an integrated programme that aims to boost farm production and profits.

and the International Rice Research Institute (IRRI) - have collaborated in the creation of the IRRI-ICLARM Rice-Fish Farming Systems Research Project, which is funded by the Asian Development Bank (ADB). The project aims to make the technology work through researches on the fish component, requirements of the rice crop, and farmers' attitude toward rice-fish farming.

The ICLARM and IRRI, both based in the Philippines, are just two of 18 centres worldwide supported by the Consultative Group on International Agricultural Research (CGIAR). Many other research institutions and donor agencies are recognizing the importance of rice-fish farming. A number of important research activities on the technology are going on in farm fields and research stations.

oration with the Sakon Nakhon Rice Experiment Station in northeast Thailand, is examining the effect of a polyculture of common carp (Cyprinus carpio), Nile tilapia (Oreochromis niloticus), and silver carp (Puntius gonionotus) stocked at 5,000 fish per hectare and on the yields of the rice varieties RD6, RD15, and KDML 105.

According to Greg Chapman, a Canadian who worked on the project in Thailand, "fish take useless things and turn them into protein". He notes that fish eat algae, rice pollen, weeds and insects while also fertilizing the soil more effectively than commercial products. Fish likewise reduce pests by eating leafhoppers, stem borers and aphids, and lower the incidence of several rice diseases. In addition, rice-fish farming creates a reliable source of protein for the farmers, offsetting the decreased availability of wild fish in many countries.

In the West Java Project in Indonesia, the introduction of ducks enhanced the rice-fish ecosystem. They eat crabs and insects and their droppings act as a nutritive addition.



Aquaculture research in India.

— FAO photo

The 2,000-year-old technique was abandoned by many countries when the 'green revolution' was introduced

jeus) and common carp are grown under these circumstances. "Asian farming is rice-based, and has the potential to produce large quantities of high-value fish on irrigated land," says an ICLARM official.

Fish species also most adaptable to rice fields in Asia are Java tilapia (O. javanicus), snakeskin gourami (Trichogaster pectoralis), walking catfish (Clarias spp.), snakehead (Channa spp.), seabass (Lates calcarifer), grass carp (Ctenopharyngodon idella), and crucian carp (Carassius spp.).

SCIENTISTS IDENTIFY PROTEIN IN SALIVA THAT BLOCKS AIDS VIRUS

by Jim Fuller

SCIENTISTS have identified a protein in human saliva that blocks the AIDS virus from infecting critical immune system cells that are the targets of the virus.

Researchers of the US National Institute of Dental Research (NIDR) told an AIDS meeting that a small protein in saliva called secretory leukocyte protease inhibitor, or SLPI, provides protection by binding to the surface of white blood cells. These cells are also known as T-helper cells because they help orchestrate the body's immune response to infection.

The latest findings may help to explain why AIDS does not appear to be spread by saliva. In fact, concentrations of the human immunodeficiency virus (HIV) that causes AIDS are very low even in the saliva of AIDS patients.

But researchers caution that just how SLPI protects against infection remains a mystery. The protein, which is found in the coating of most mucous membranes, is believed to be a natural protector against the body's own protein-destroying enzymes.

Results of the latest study were presented at the Conference on Human Retroviruses and Related Infections being held from January 29 through February 2 in Washington.

McNeely said it may be possible eventually to inject SLPI directly into the blood stream to keep the virus from attacking blood cells. SLPI already circulates in the blood, but in extremely low levels.

It has been known for some time that AIDS does not appear to be transmitted readily through kissing or oral sex, and scientists have been searching for the components in saliva that prevent HIV infection.

But the extent of the protein's activity against HIV in fluids other than saliva, as well as its potential as a protective agent against the transmission of HIV, has yet to be determined.

Researchers said that while it was known that saliva contains molecules that help clear microbes from the mouth, even when these molecules were removed saliva's protective effect against AIDS continued. Now a team led by McNeely and researcher Sharon Wahl, also of NIDR, have identified the factor that may play a key role in providing that protection.

Further experiments showed that SLPI works by

The Sukamandi Research Institute for Food Crops and the Indonesian Research Institute for Freshwater Fisheries are also collaborating in a project sponsored by the International Development Research Centre (IDRC) to raise the visibility of rice-fish farming among Indonesian farmers and government policy-makers. Dr Achmad Fagi, leader of the Indonesian project, found that "rice-fish culture with common crop actually increased the yields of the commonly used (rice) varieties."

In Thailand, the Farming Systems Research Institute (FSRI) of the Department of Agriculture is actively pursuing rice-fish research. An on-station trial, conducted in collaboration with the Sakon Nakhon Rice Experiment Station in northeast Thailand, is examining the effect of a polyculture of common carp (Cyprinus carpio), Nile tilapia (Oreochromis niloticus), and silver carp (Puntius gonionotus) stocked at 5,000 fish per hectare and on the yields of the rice varieties RD6, RD15, and KDML 105.

Dr P K Mukhopadhyay has been conducting studies in West Bengal, India on deep-water-rice-fish culture. Encouraging results have been found when rohu (Labeo rohita), mrigal (Cirrhinus mrigala), Java carp (Puntius javanicus) and common carp are grown under these circumstances.

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Rich-fish culture is also being undertaken in other countries.

Rice-fish culture can actually increase the yields of rice up to 25 to 30 per cent while providing farmers with extra income. According to an IDRC official, this is important in some areas such as northeastern Thailand, where the farmers are marginalized, cultivate under difficult conditions and find the cost of pesticides and fertilizers financially burdensome.

A study conducted by CARE-Bangladesh in Rangpur showed that in 1991, some 63 per cent of project area farmers who used pesticides in their rice fields completely stopped using pesticides after trying rice-fish farming.

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Indonesia - rice fish culture provides farmers with extra income. — FAO photo

Not Knowing Your Left From Your Right

by Holger Hank

By no means all people are dependent upon the directional indicators left and right for orientation. Researchers from the Max Planck Institute for Psycholinguistics in the Dutch town of Nijmegen have discovered, for example, that the Tenejapas Indians from the southern Mexican state of Chiapas can get around easily without these directions.

world before us can we divide the world into a left half and a right half. According to Levinson, the Indians possess a type of in-built compass which enables them to orientate themselves on an absolute, immutable system of reference.

right". From their perspective the hot-water tap could change sides arbitrarily.

The Tenejapas are not unique in this regard: The researchers have now traced six communities which orientate themselves on a system of fixed reference points in a way similar to the Mexican Indians.

"This would be comparable to our knowing instinctively where North, South, East and West are." Instead of the four principle directions, however, the Tenejapas use only three: namely "upwards", "downwards" and "across" - which they derive from the steep inclines of the terrain in which they live. For example, "the man is standing to the right of the tree", translates into the Tenejapas tongue as:

"The man is standing upwards of the tree".

Their points of reference are not always derived from the surrounding landscape.

male Aborigines were each driven to different sites in the Bush and asked to point in the direction of known locations of between 7 and 200 kilometres away. The sites chosen were in a very rugged area, allowing no direct path from A to B. Among the 120 test subjects, the average deviation from the direction of the location amounted to less than 4 per cent, or 13° on the compass.

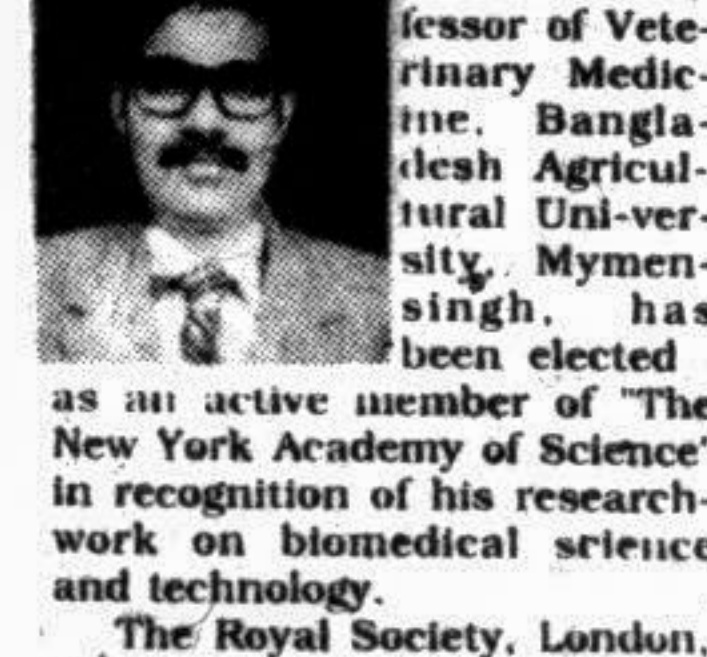
Penelope Brown have been travelling to this remote mountain region twice a year to study the approximately 15,000 Indians living there. From their investigations, the Max Planck researchers have established that the Tenejapas' vocabulary not only lacks several words important for Europeans but also that the Indians think within the structures established by their language.

Although the first roads and power lines have now penetrated through to this remote mountain region of southern Mexico, the Tenejapas still encounter difficulties outside their familiar surroundings.

Some cultures orientate themselves by the sun or the prevailing wind directions, and such fixed systems of reference make great demands on the memory and imagination of the people. For example, John Haviland from the Max Planck Institute observed that the Hopevale Aborigines of northern Australia use hand signals conspicuously often when giving someone directions. Tests have demonstrated that the Aborigines' positional sense has become so highly developed that they are able to point accurately in the same direction over distances of hundreds of kilometres.

Indeed, the philosopher Immanuel Kant regarded the division into left and right as one of the basic elements for spatial thought, common to all peoples throughout the world. However, the Nijmegen researchers are now advocating a different approach. "We cannot simply transfer the research findings from our own culture to people of other cultures", warns Stephen Levinson. "People are much more diverse than most scientists have been prepared to believe."

Bangladeshi Scientist Honoured



Dr Md Abdus Samad, Professor of Veterinary Medicine, Bangladesh Agricultural University, Mymensingh, has been elected as an active member of "The New York Academy of Science" in recognition of his research work on biomedical science and technology.

The Commonwealth Commission, London, also awarded him a Commonwealth Academic Staff Fellowship in 1989. He worked on toxoplasmosis under this programme with Professor M J Charleston at the University of Liverpool, England. He obtained his Ph.D from the Haryana Agricultural University (HAU), India, in 1982 and the HAU awarded him a certificate of Merit with Prize for an outstanding Transcript Academic Record in his Ph.D programme. He has more than 70 research publications in national and international journals and two professional books in the Bengali language to his credit.

In addition to his academic duties, he works as a Principal Investigator of a collaborative research project on toxoplasmosis, funded by the Bangladesh Medical Research Council, with Dr Sayeba Akhtar, Professor of Obstetrics and Gynecology, Mymensingh Medical College.

Mosquito Repellents from Plant Oils

A common aromatic shrub called "nirgundi" in Ayurveda and Vitex negundo by botanists has been found to contain an oil in its leaves which may be an excellent mosquito repellent.

Leaf extracts of this shrub have earlier been reported to be effective against rheumatic swellings of the joints, as a tonic and vermifuge, while the smoke from the burning leaves is used to relieve headaches.

Maharashtra use the smoke of the leaves of Vitex negundo at night to protect themselves from mosquito bites, led the NCL researchers to examine the scientific validity of the practice.



The scientists systematically evaluated the volatile oils from the leaves of Vitex for mosquito repellent activity, on the basis of protection period offered against mosquito bites.

During experiments, a human had covered with a snugly fitting polythene bag was introduced in a cage containing 1000-1500 hungry mosquitoes. The mosquitoes were allowed to bite on the back of the hand through a mesh cloth screen stuck over a hole cut in the polythene bag. Reporting their findings in

Food for Thought

Preservatives — The Chemicals We Consume

by Saqib Hussain Shirazi

FOOD is one of the primary needs of life. In ancient times, men lived from hand to mouth, and did not realize any need for preserving their food. But as time passed, civilization developed and men discovered various processes for the preservation of foods. Food preservation is required because in normal environmental conditions large quantities of food become spoiled.

Critic acid is used in syrups, drinks, jams and jellies as a substitute for fruit flavors and for preservation. Lactic and acetic acids are added to brines of various kinds, green olives etc.

When foods spoil, they undergo physical and chemical changes that may render the food inedible or hazardous. Two chief causes of food spoilage are the growth of microorganisms (particularly bacteria, moulds, yeasts) and the action of enzymes that occur normally in the food. Thus, preservation of food is based on retarding the growth of spoiling organisms in food, and also controlling enzymatic actions in food.

Sorbic and propionic acids are used for inhibiting mould growth in bread. The effectiveness of these acids is mainly dependent on the toxic action of the acid or salt. The higher the salinity and the stronger the acid, the more effective are these organic preservatives.

Methods of food preservation are of two general classes: (1) Bactericidal or sterilizing methods, involving heating, canning and radiation (2) Bacteriostatic, which includes drying, treating at low temperature, using various chemicals etc. No method of food preservation however will improve the original quality of the food product.

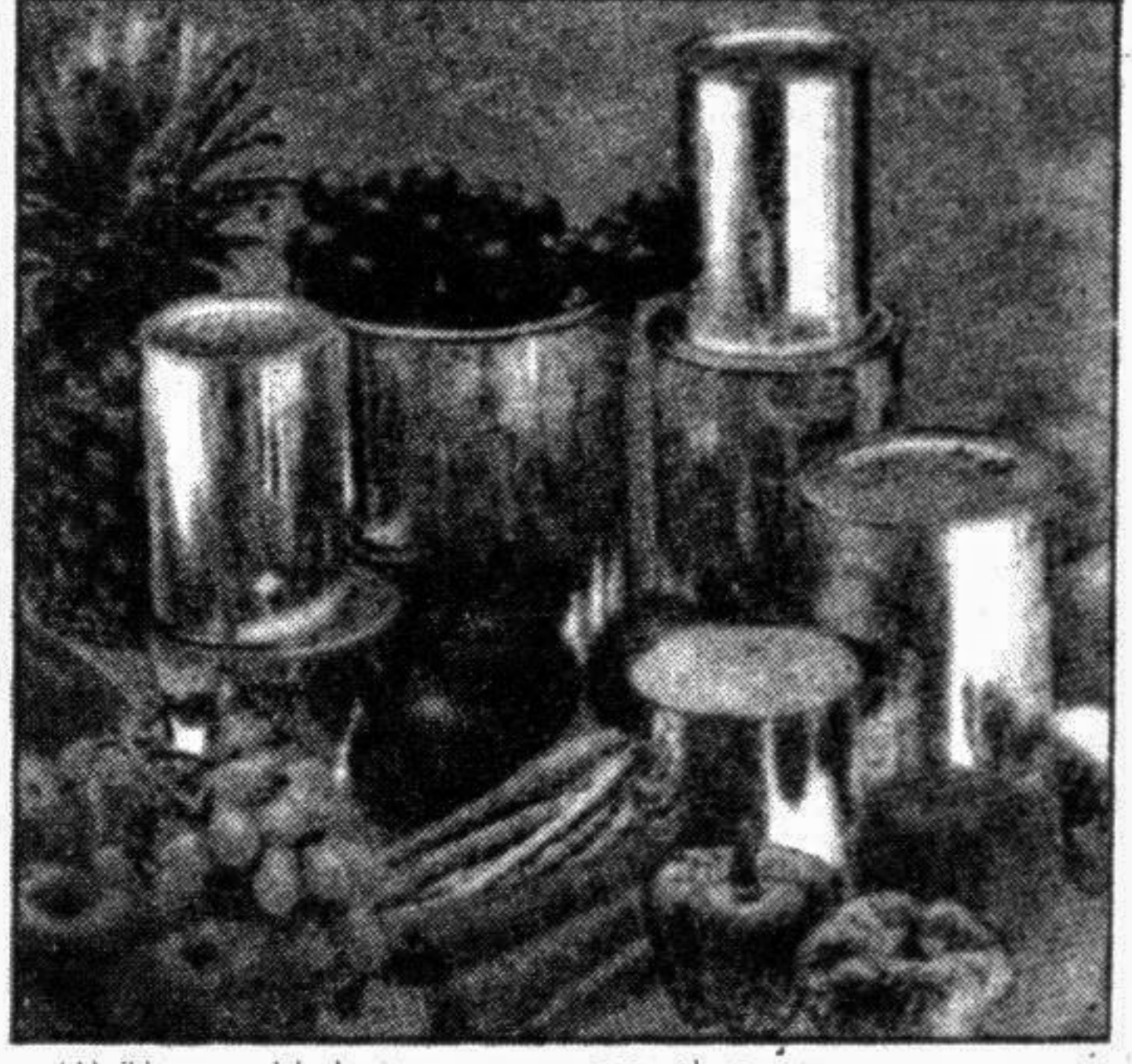
Benzoates (salts of benzoic acid) are used in jams, jellies, margarine, pickles, fruit juice etc. Sodium benzoates are only effective when used in acidic solution. Acetic acid in the form of vinegar (vinegar is actually 6-10% acetic acid solution) is used as a preservative in pickles.

Commercially, chemical preservatives are used to preserve food for long periods at a time. Those food additives which are especially added to prevent deterioration and decomposition of food are called chemical preservatives. The inhibition of the growth and activity of microbes is one of the main purposes of the use of chemical preservatives. A chemical preservative should have a wide range of antimicrobial activity, should be nontoxic to human beings, should not be inactivated by the food or any substance in the food, should not encourage the development of resistant strains, should not have any effect on the flavor, taste, or aroma of the original food and should kill rather than inhibit microbes. Chemical preservatives are used either independently or in combination, with other forms of preservation, to maintain a food in its original or fabricated state and to prevent excess losses from deterioration. Moreover, those additives which are added have maximum levels of concentration which can be permitted in food.

Sodium nitrate, or nitrite, or mixtures of these, are commonly added to sodium chloride in mixtures for curing meat. The nitrite has two main functions: to preserve the pleasing red color of the meat by reacting with food components in the meat, and to prevent the germination and growth of any botulism endospores that might be present (botulism is a kind of food poisoning caused by anaerobic bacteria, clostridium botulinum).

From a general point of view, preservatives can be grouped into two categories:

Different spices vary in their effectiveness, depending on the source, the freshness, and whether they have been stored whole or ground up. Cinnamon and cloves, containing cinnamic aldehyde and eugenol, respectively, usually are more bacteriostatic than



(1) Those added preservatives not defined as such by law: natural organic acids (lactic, malic, citric etc) and their salts, vinegars, sodium chloride, sugars, spices and oils, wood smoke, nitrogen.

Wood smoke contains a large number of volatile compounds that may have bacteriostatic and bactericidal effect. Formaldehyde which is effective against molds, bacteria and viruses is considered the most effective of these compounds. Phenols and cresols are also generated from wood smoke.

The actions of these chemicals in food are described below.

Among the chemical preservatives only sodium nitrate are carcinogenic. Reaction of nitrites with aminoacids forms nitramines which are carcinogenic. Besides the above mentioned chemicals, certain antibiotics have been tested on fish, meats, poultry, in an endeavour to lengthen the storage time at chilling temperature. The FDA (Food and Drug Administration of USA) have approved tetracyclines at 5ppm (parts per million) only on fish and unpeeled shrimp. It is vital to mention the name of the preservative, and its concentration, used in food during marketing of the product. But there are too many industries in our country which are marketing various kinds of jams, jellies, pickles, fruit juices without mentioning the name and concentration of preservatives used. Shouldn't the authorities pay attention to this matter? We should be aware of what goes into our bodies through the food we consume.