



Our plant breeders are arms dealers in an evolutionary arms race

The War Going on inside Tomato Cells



The latest example of this war is a bacterium (*Pseudomonas syringae*) that infects tomatoes by injecting a special protein into the plant's cells to undermine its defense system.

“Plant breeders often find that five or six years after their release, resistant plant varieties become susceptible because pathogens can evolve very quickly to overcome plant defenses,” says Gregory Martin, Cornell professor of plant pathology, senior author of a recent paper on the topic published in the journal *Nature*. “However, every now and then, breeders develop a plant variety that stays resistant for 20 years or more.” It is important to understand the molecular reasons why some varieties have more durable disease resistance.

Normally, the tomato's defense system is primed and on the lookout for the likes of *P. syringae* thanks to a special detector protein in its cells that acts like a molecular guard dog that attaches to intruders.

But some strains of *P. syringae* have developed a sneaky means of neutralizing this faithful guard dog. They inject a protein which mimics one of the tomatoes own

disposal stickers – an enzyme that it uses to identify intruders to be destroyed. This fake disposal sticker attaches to the tomato's molecular guard dog, convincing the cell that this is really a stray mutt to be locked up. Having tricked the tomato into neutralizing its own early warning system the bacterium sneaks in to cause mayhem and disease.

This particular molecular guard dog is present in both cultivated tomatoes and many wild tomato species. So it has probably been protecting the tomato family from *P. syringae* for a very long time. Only recently have strains of the bacterium developed the fake disposal stickers to turn the tomato's security system on itself

The paper provides molecular data that supports the theory of an evolutionary 'arms race' in which pathogens develop new ways to spread and attack organisms, and the organisms in turn create novel defenses, each in a continuous battle to outdo the other.

Adapted from a review in Genetics News referring to:

Tracy R. Rosebrock et al. (2007) A bacterial E3 ubiquitin ligase targets a host protein kinase to disrupt plant immunity. Nature 448, 370-374

- Communications

The Information You Need, the Library Can Find!



The library provides customized searching to find the literature you need to help write papers and proposals or even in managing projects.

This is a small selection from over 190 articles recently gathered on **VEGETABLE SEED PRODUCTION** for the vBSS project. Those marked with * are currently held by the library and could be provided immediately. Other articles would have to be obtained by interlibrary loan and the books purchased if needed.

Singh, N.P., (2006). Vegetable seed production technology. Lucknow: International Book Distributing Co. vi, 227 pp.

Tay, D., (2006). Vegetable hybrid seed production in the world. In: Handbook of seed science and technology. Binghamton: Food Products Press. p.703-718.

* Basra, A.S., (2000). Hybrid seed production in vegetables: rationale and methods in selected crops. Binghamton, NY: Food Products Press. ix, 135 pp.: figs.

Technical Centre for Agricultural and Rural Cooperation, (2000). The role of smallholder farmers in seed production systems. Wageningen: CTA. 34 pp.

* George, R.A.T., (1999). Vegetable seed production. Wallingford, Oxon: CABI Publishing. 336 pp.: figs tables

Alizai, M.A., (1998). Status of vegetable seed production in Baluchistan [Pakistan]. In: Proceedings of a symposium held at the Plant Genetic Resources Institute, NARC, 28-29 May 1997, Islamabad, Pakistan. Islamabad: PARC. p.79-81

* Salunkhe, D.K., Kadam, S.S., (1998). Handbook of vegetable science and technology: production, composition, storage, and processing. New York, NY: Marcel Dekker, Inc. x, 721 pp.: ill., tables.

Thapa, P.K., (1998). Economic efficiency of contractual vegetable seed production in the eastern hills of Nepal. Laguna: UPLB. 231 leaves

* Arya, P.S., (1997). Vegetable growing in hills. New Delhi: M D Publications Pvt Ltd. ix, 439 pp.: ill., tables

McDonald, M.B., Copeland, L.O., (1997). Seed production: principles and practices. Columbus, OH: Department of Horticulture and Crop Science, Ohio State University. viii, 749 pp.

Ghimare, A.J., Bhattarai, M.R., (1994). A situation report on vegetable seed production in the Koshi hills. Dhankuta: Pakhribas Agricultural Centre. 16 pp.

Zulu, P.H.H., (1992). Vegetable seed production: a recent project in Malawi. In: A paper presented at the Vegetable Seed Production In-Country Course, 9-22 February, 1992. Rome: Agriculture Dept., FAO. 9 pp.

Food and Agriculture Organization of the United Nations, (1990). Workshop on vegetable seed production for small farmers; Proceedings - training course, Lujan de Cuyo, Mendoza (Argentina). 19-28 Feb 1990. Santiago: Regional Office of Latin America and Caribbean, FAO. 256 pp.

Qualiotti-Auxilia, L., (1990). Report of consultancy on vegetable seed production. Rome: Agricultural Operations Div., FAO. 62 pp.

Mabesa, R.C., (1986). Improved vegetable seed production techniques for the warm and humid tropics. Laguna: UPLB. 23 leaves

For searches like this customized to your needs please contact the library.

New Popular Magazines Now Available in the Library

The Economist: Surviving the markets – 18th–24th August 2007

PCWorld: Ultimate mobile tech guide – September 2007

Photo Techniques – September/October 2007

Time: Why Diana mattered – 27 August 2007



Arrival of Dr. Madhusudan Bhattarai Agricultural Economist, Socio-economics Unit



Dr. Madhusudan Bhattarai, Agricultural Economist, Socio-economics Unit arrived at the Center on 22 August. He was accompanied by his wife (Anita) and their two children (daughter Akriti at 6 and son Raunak at 1). The Bhattarais will stay in the House 808 (ext.

808) in the campus. Dr. Bhattarai's office will be located at the Guest Room 207 (at the north wing of the 2nd floor of the FDS building) with extension number 460, <madhu.bhattarai@netra.avrdc.org.tw>.

- Source: Dr. Yin-Fu Chang/DDG-A&S

New Staff—Benjamin E. Rakotoarisoa vBSS Project NBU Liaison Officer for Madagascar



Mr. Benjamin (Benj) E. Rakotoarisoa has been appointed as Liaison Officer for the National Breeding Unit based in Madagascar for the Project "Vegetable Breeding and Seed Systems for Poverty Reduction in Africa" (in short: vBSS Project NBU Liaison

Officer for Madagascar), for an initial period of two years, effective 15 July 2007.

Benj received his Master's degree in Agronomy from University of Agronomy, Madagascar in 1984. He has more than twenty years of professional experience in research and management. His research experience includes potato, sweet potato and cassava germplasm screening, variety trials, off-farm trials, participatory on farm trials through to potato seed production system management. It included the full range of work from in vitro culture to screen house pre-basic seed potato production and highland seed potato production.

Benj's major responsibilities as vBSS Project NBU Liaison Officer for Madagascar are (1) establishment of a National Breeding Unit (NBU) in Madagascar for the vBSS Project, including but not limited to, office site identification, securing licenses and permits, office physical arrangement, establishment of systems and procedures for its operation in accordance to AVRDC's policies and guidelines; (2) overall management, coordination and leadership of the NBU in Madagascar; (3) coordinate activities with NARES, regulatory

agencies (including variety release, seed health and quarantine) and the private sector in the country to facilitate and accelerate the variety release process of new vegetable varieties; (4) coordinate the project's in-country vegetable breeding operations, and support outreach to neighboring countries; (5) support demand creation activities, which will be conducted mainly through the relevant NARES agencies and in partnership with NGOs and the private seed sector; (6) be responsible for the links between the Madagascar NBU and AVRDC, with other NBUs and stakeholders working directly with the NBU (e.g. advanced breeding institutes, international seed companies); and (7) ensure timely production of necessary documentation of vBSS Project activities.

Benj's email address is benjaarisoa@yahoo.com. His temporary office address is MAEP, BP 301, Anosy Antananarivo, Madagascar.

We wish Benj every success in his appointment with AVRDC.

- Lilia Tan Habacon, Human Resources Manager

JIRCAS-funded IV Research at AVRDC-ARC



Polygonum odoratum Lour. - a native Thai vegetable included in the study.

The AVRDC-ARC, with funds from the Japan International Research Center for Agricultural Sciences (JIRCAS), has recently embarked on a project to study the effects of environmental conditions on the antioxidant activities of indigenous vegetables including the effects of post harvest storage. Entitled “*Variation in activities and contents of active compounds of vegetables caused by cultivation and storage conditions*”, the project is an off shoot from previous

successful collaboration with JIRCAS on Asian indigenous vegetables which began in 2004.

The project will identify the anti-oxidant properties of selected indigenous vegetables and the effects of cutting methods, seasons and storage on anti-oxidant activities, along with the performance of new accessions..

Work will also include comparison studies on the effect of organic farming with conventional farming of indigenous vegetables and a comparison of farm grown crops with those grown on the ARC research station. These activities will be carried out while an extract library is constructed and maintained.

This collaborative work with JIRCAS recognizes the rich heritage of Asian indigenous vegetables and their potential to both improve farmer incomes and community nutrition.

- Source: AVRDC-ARC

News from Africa

Workshop Participation

Mr. Jan Helsen and Dr. Rémi Nono-Womdim will hold a vBSS inception planning workshop at RCA from 29 to 31 August, in which staff from AVRDC HQ will also participate. The workshop will determine the main

Visitors

Ms. Josephine Okot, Managing Director of Victoria Seed Company, Uganda visited RCA from 20 to 21 August. The aim of her visit was to collaborate with RCA in developing mechanisms for contract seed production of AVRDC tomato and African eggplant varieties, released by the company. It has released AVRDC Cherry tomato line CLN1558A as Josefina; African eggplant line AB2 as Cleo, and line DB3 as Tessa Oval egg.

A group of 8 progressive farmers from Mwanza District, Kilimanjaro region of Tanzania visited RCA on 21 August. The farmers were accompanied by an extension official from the Mwanza District Agricultural Office. The aim of their visit was to familiarize themselves with AVRDC varieties and production technologies.

drivers for vegetable breeding and seed systems in SSA and establish a clear work plan for 2007 and 2008.

Mr. Wachira Kaguongo from CIP, Nairobi and Anna Herforth from Cornell University, USA will visit RCA from 27 to 28 August to discuss the baseline survey for the Traditional Food Project (TF-Project, formerly known as Kilimo Trust Project) with Mr. Stefan Pletziger. Anna will stay at RCA until 13 October to support the implementation of the baseline survey and integrating some nutritional issues for her PhD thesis.

- Source: Dr. Shilpi Saxena/AVRDC-RCA

Travel

Drs. Paul Gniffke and Peter Hanson, 27-31 August, to Arusha, Tanzania, to attend the vBSS Inception Workshop. Dr. Peter Hanson, 1-9 September, to Madagascar, to visit vegetable and seed production sites.

Mr. Christian A. Genova II, 2 September-13 October, to Cambodia, Lao PDR and Vietnam, to attend in-country training on the survey of leafy vegetable value chains and market opportunities, and facilitate and supervise survey activities.

- Source: Yvonne Ting/ASU

Dr. Drissa Silué and Mr. Stefan Pletziger, 5-8 August, to Nairobi, Kenya, to attend the Monitoring meeting of the Traditional Food project (Kilimo Trust) held at ILRI.

Drs. Mel Oluoch, Jan Helsen, Rémi Nono-Womdim and Drissa Silué, 14 August, to visit

contract farmers in Arumeru District who are producing Tomato seeds for East African Seed Company.

Dr. Ekow Akyeampong, 17-28 August, on leave.

Dr. Sanjeet Kumar, Vegetable Breeder (AVRDC-ICRISAT, Niamey), 29-31 August, to Arusha, Tanzania, to attend the Inception Planning Workshop held at RCA.

Dr. Detlef Virchow, 3-4 September, to Southampton, UK, to participate in the 5th International Symposium on New Crops and Uses: Their Role in a Rapidly Changing World and to present a paper on "Indigenous Vegetables in East Africa: Sorted out, forgotten, revitalized and successful!"

- Source: Dr. Shilpi Saxena/AVRDC-RCA

Service Hours of AVRDC Post Office

Over recent months the AVRDC Post Office has been relocated to the Shanhua Post Office during the renovation of Chandler Hall. To facilitate our staff dealing with the AVRDC Post Office during our lunch break, the AVRDC Post Office has agreed to adjust their service hours as follows starting next Tuesday, 21 August 2007:

0830-1300 hours and 1330 to 1630 hours.

亞蔬郵局因中心的行政大樓整建工程，暫時遷移至善化總局辦公，為方便本中心員工在午休時間能至郵局辦事，亞蔬郵局的營業時間自8月21日（星期二）起改為：上午0830-1300，下午1330-1630。

- Source: Dr. Yin-Fu Chang/DDG-A&S

Congratulations! Dr. and Mrs. Srinivasan Ramasamy!

Mrs. Malini Srinivasan delivered a male baby on Wednesday, 15 August 2007 at Chi Mei Foundation Hospital in Tainan. The baby has been named Iniyan Achyudhan (ACHYU), weighed in at 3.35 kg and measuring 53 cm at the



time of birth. Both mother and baby are fine now.

Picture: Left to right

Malini, Srini's mother, Dr. Mike Lin with ACHYU and Srini with Arun

- Source: Dr. Srinivasan Ramsamy

Indoor Games in the Taiwan Typhoon Season

We can't change this rainy weather and most of us are stuck inside, so let's make the best of it. Come and join us next Wednesday the 29th of August for an indoor cards, table games and karaoke party in the cafeteria, from 1500 -1630hours. The Recreation and Social Committee will prepare games such as: Mah-Jong, Uno, Memory, Set, Scrabble and Boggle. You may bring a board game, form a team, join a team or just come, have some tea, coffee or snacks and watch a game or two. You're also welcome to entertain everyone by singing karaoke songs. Come join the party and have some fun!!!

因颱風帶來下雨的狀況，使我們無法在室外運動，八月份康委會的活動只好改在室內。8月29日（星期三）下午3點至4點30分，在餐廳有麻將、撲克牌遊戲、猜謎、拼字等桌上遊戲，以及卡拉OK歌唱等等。你可以來玩，也可以來觀看，別忘了星期三下午3點到餐廳喝點咖啡、吃個點心，玩一兩樣遊戲，或唱首歌讓大家欣賞，放鬆一下心情！8月29日下午3點餐廳見噢！

- Source: Recreation and Social Committee

What's New on the AVRDC Websites?

GHI Website: <http://www.globalhort.org>

- ∇ News - Fighting poverty with herbal and medicinal plants; Awareness Raising Conference on Horticulture for Development (in English and French)
- ∇ Downloads/Paper - The Global Horticulture Initiative Model could improve the networking capacity of the HMAP Research for Development Community

RCA Website: <http://www.avrdc.org/rca.html>

- ∇ Jobs - [Enumerators RCA](#)

Grants Development Website:

<http://www.avrdc.org/intranet/gdo.html>

- ∇ Revised Selection Guidelines for GTZ/BMZ proposal submissions
- ∇ Funding News 20 August 2007 - RIU's innovation challenge fund call for proposals and a list of recently submitted and awarded AVRDC proposals

Intranet: <http://www.avrdc.org/intranet/home.html>

- ∇ Directory
 - New phone numbers and e-mails, AVRDC Alumni Email Addresses – 2007 Trainees; and Style Guide – New additions
- ∇ Seminar Presentation by Dr. Larry Sanders on "Controlling Fertilizer Reactions in Soil Microenvironments to Increase Nutrient Use Efficiency and Crop Yields"
- ∇ Staff Meeting – Annotated Notes 6 July 2007
- ∇ Workgroup: SI Project Team – Inception Report

- Source: Communications

Special Dish Menu for Lunch

Starting August 2007, every Tuesday and Thursday, Ms. Elsa Lago, Special Cafeteria Aide will prepare one special international cuisine with a limited amount of 20 portions for the lunch. The August menu was much appreciated by staff, and these are the selections for September. Please check them out and make your reservations with the Cafeteria (ext. 242).

自八月份起，每星期二、四中午，餐廳由特別助手 Ms. Elsa Lago 為大家準備不同國家西式餐食一種（以二十份為限）。推出以來頗受歡迎，感謝大家之肯定！下星期二起連續四週預定推出之菜單如下；有興趣者，請向餐廳（分機 242）詢問訂購。謝謝大家！

- Source: Lydia Wu/FDS

Date日期	Day星期	Menu 菜名	Country國家	Remark備註
08 / 28	Tue. 二	Baby back ribs w/ mashed potato 豬肋排與洋芋泥	American美國	
08 / 30	Thu. 四	Tom Yam Kong 泰式酸辣蝦湯	Thailand泰國	Spicy 酸辣
09 / 04	Tue. 二	Estopada de Lingua 醬燒豬莉	Spanish西班牙	Pig tongue 豬舌
09 / 06	Thu. 四	Spaghetti Bolognese 義大利麵	Italian義大利	w / ground beef 碎牛肉
09 / 11	Tue. 二	Chicken Tinola 雞肉燴青木瓜等	Philippines 菲律賓	w / green papaya, etc. 青木瓜
09 / 13	Thu. 四	Beef Rendang 椰漿牛肉	Indonesia印尼	Spicy 香辣
09 / 18	Tue. 二	Chicken Tandoori w/ Mulligatawny soup 咖哩雞肉湯	Indian 印度	Spicy 香辣
09 / 20	Thu. 四	Tacos 墨西哥玉米餅	Mexican 墨西哥	w / ground beef 碎牛肉