

VETIVERIM

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Editorial

From Bang Saen with Love

During the period from 22-24 June 2014, the Editor had the privilege of attending the largest event related to vetiver ever held in Thailand. It was jointly organized by the Chaipattana Foundation, the Office of the Royal Development Project Board, the Land Development Department and the PTT Public Co.Ltd. It was held at Burapha University in Bang Saen, Chon Buri Province. The theme of the event is "Miracle Vetiver Grass Under the Royal Benevolence", which includes the following activities: (i) the 2nd Exhibition of the Vetiver Lovers of Thailand Network, (ii) the 6th National Conference on Development and Promotion of the Utilization of Vetiver Under His Majesty's Initiatives under the theme "23 Years: Miracle Vetiver Grass – Absorbing the Water, Embracing the Soil, Filling the Stomach", and (iii) Awarding Ceremony of the 8th Competition of the Development and Campaign on the Utilization of Vetiver under His Majesty's Initiatives. It was attended by 2,500 people who are vetiver scientists and technicians from various agencies, villagers who are the members of the Vetiver Lovers of Thailand Network, members of the Social Public Network, officials of various agencies, the judges and winners of the various competitions, the regional committee for judging of the competition, and "Mo Din" (soil doctors) of the Land Development Department.

During the 3-day program, the following activities were presented: the keynote address on "Vetiver – 23 years in Serving His Majesty's Initiatives"; workshops on "Syllabus of the Course on Lively Learning about Vetiver" and "Products from Vetiver Leaves"; panel discussions on "Vetiver Absorbs the Water, Embraces the Soil and Penetrates its Roots towards Sustainable Agricultural Way-of-Live", "Vetiver Experiences at the Global and National Levels", and "Vetiver Solves the Problem of Global Warming"; brain storming on "Knowledge Gained from Research and Experimentation" and "Dissemination of Knowledge on Vetiver"; and exhibitions.

It was the most memorable and learning experience for the Editor to participate in this most valuable and lively event. He was quite busy in all these activities such that he did not even had time to enjoy the atmosphere of the seaside town of Bang Saen, a longtime most popular place for recreation in Thailand.

Vetiver Hedgerows along Tat Noi Creek at Nong Nae Subdistrict, Phanom Sarakham District, Chachoengsao Province, Thailand to Decrease the Exposure of Villagers to Residual Phenol from Illegal Industrial Wastewater Dumping*

Communities at Nong Nae Sub-district, Phanom Sarakham District, Chachoengsao Province, Thailand has suffered from illegal dumping of industrial wastewater containing high phenol (C_6H_6O) (as high as 500 mg/L) for more than 2 years. Phenol migrates from the dumping points causing contamination of shallow-well groundwater and Tat Noi Creek, the main creek of the villagers. All of the villagers there utilize shallow-well groundwater as their sole drinking water source. Even though the illegally dumped wastewater was removed from the environment, various government agencies monitored the contamination and reported that phenol concentration in shallow-well groundwater exceeds the maximum contamination level (1 $\mu\text{g/L}$) for more than 250 times in households downstream the direction of shallow groundwater and surface water runoff flow. This is presumably due to residual phenol in the environment as a result of contaminant migration. Phenol is a hazardous substance causing irritation and kidney inflammation. If phenol-contaminated water is disinfected by chlorination, chlorophenols (carcinogenic substances) will be formed and pose even more serious threat to the villagers' health. In order to protect community's health at Nong Nae, decreasing phenol exposure to the villagers is mandatory.



Figure 1. one of the 18 news clips on Chanel 3 reporting the volunteers cultivated vetiver fence at Nong Nea subdistrict

* By Tanapon Phenrat, Department of Civil Engineering, Faculty of Engineering, Naresuan University, Phitsanulok, Thailand.

During 28-29 August 2014, more than one hundred volunteers including Nong Nae villagers, undergraduate students from Naresuan University, primary school students from Nong Nae communities, representatives of the Office of the Royal Development Projects Boards, local government agencies, and news reporters and actors and actress from Channel 3 TV Thailand were present at the site to cultivate 0.12 million vetiver (bare root) to create 1.2-km vetiver fence along the Tat Noi Creek, the major way of transporting residual phenol to shallow wells of the villagers. Three to five rows of vetiver hedgerows were planted, covering around 1-1.5 m of the creek banks. Vetiver hedgerow is widely accepted as an effective measure to prevent erosion of the creek banks. However, here at Nong Nae, the volunteers aimed at vetiver hedgerows to transform phenol to harmless polyphenols through the action of H_2O_2 and peroxidase produced from the root of vetiver. According to our recent laboratory study, phenol was degraded at the rate of 115×10^{-4} and $208 \times 10^{-4} \text{ hr}^{-1}$ by vetiver grass on a floating platform. With this information, our theoretical calculation suggests that the 1.5-kilometer of vetiver fences with the width of 1.5 meter should decrease phenol transporting along the creek at the maximum removal efficiency of around 40% (depending on surface water flow rate) and should decrease phenol migrate through soil to the shallow wells at the maximum removal efficiency of around 80% (depending on seepage velocity). According to the author's knowledge, this is the first time that vetiver fence is used for phenol degradation in field scale, especially for community prevention from hazardous constitutes from illegal dumping. This voluntary activity was reported in 18 news clips on Channel 3 from 27 to 29 August, 2014.

Report of the Thai National Conference on Vetiver

The 6th National Conference on Vetiver held between 22 – 24 June 2014 at Burapha University in Chon Buri Province, Thailand, is another great milestone of the development and promotion of the utilization of vetiver grass in Thailand. His Majesty King Bhumibol Adulyadej gave his first initiative on vetiver grass on 22 June 1991. Therefore, the theme of this conference is “23 years: Miracle Vetiver Grass – Absorbing the Water, Embracing the Soil, Filling the Stomach,” which reflects the continuous development and promotion of the utilization of vetiver grass in response to His Majesty's initiative to achieve soil and water conservation and better standard of living of the people.

On 22 June 2014, H.E. Mr. Ampol Senanarong, Privy Councillor, inaugurated altogether 3 events, jointly organized by the Chaipattana Foundation, the Office of the Royal Development Project Board, the Land Development Department and the PTT Public Co.Ltd. under the main theme of “Miracle Vetiver Grass Under the Royal Benevolence”, namely (i) the 2nd Exhibition of the Vetiver Lovers of Thailand Network, (ii) the 6th National Conference on Development and Promotion of the Utilization of Vetiver According to His Majesty's Initiatives, and (iii) Awarding Ceremony of the 8th Competition of the Development and Campaign on the Utilization of Vetiver According to His Majesty's Initiatives. Over two thousands of scientists, government officials, farmers, general public and students participated in the events. The aims of the combined activity were to push forward the promotion and extension work on the utilization of vetiver grass both regionally and nationally, to provide venue for exchange of knowledge and experiences among vetiver people and to give the floor to new technologies and discoveries on the utilization of vetiver grass.

The activities in the 6th National Conference on Vetiver comprised the followings:

1. Special keynote speech by Dr. Sumet Tantivejkul, Secretary-General of the Chaipattana Foundation
2. Keynote speech on “Vetiver: 23 Years Following the Royal Initiatives” by Mr. Suwat Theparuk, Secretary-General of the Royal Development Projects Board

3. Panel discussion on “Vetiver: World’s Experience and Thailand’s Experience” by Dr. Narong Chomchalow, Vetiver Expert of the Office of the Royal Development Projects Board (ORDPB) and Miss Srinith Boonthong, Advisor of the ORDPB

4. Panel discussion on “Vetiver and Climate Change” by Dr. Pisut Vicharnsorn, Advisor of the Land Development Department, Dr. Pitayakorn Limthong, Expert on Soil and Water Conservation, and Assoc. Prof. Dr. Poonpipope Kasemsap from Kasetsart University

5. Concurrent sessions with altogether 15 work presentations as follows:

Group 1: Study, Experimentation and Research Works with Dr. Piya Chalermglin as moderator.

Group 2: Extension and Dissemination Works with Assoc. Prof. Chalongsai Babprasert as moderator.

The 6th National Conference on Vetiver in Thailand was ended with tremendous success. This could be the good kick-start for the ICV-6 to come in May next year.

(See photographs of the event in the centerfold)

Letters to the Editor

Dear Dr Narong Chomchalow,

First, I would like to apologize for the disturbance. However, I read your publications about vetiver in Asia and I would like to ask you some questions about vetiver oil production in Thailand.

First let me introduce myself, I am a french scientist and field worker and I went to Thailand and surrounding countries many times since 2006 to join some scientific field trips and workshops. We were involved in scientific projects with Thai’s universities among which the Kasetsart University and we collected together many wild rodents in the fields for parasitologic surveys. I am also a naturalist and I took advantage of these opportunities to visit many wild places in Thailand and discovered the magnificence of Thai’s forests and their inhabitants. I realized what an incredible challenge it is for the Kingdom of Thailand to protect such impressive landscapes and animals according to the human population growth and the economic development. I realized also that economical development of neighbourhood populations of the national parks and wildlife sanctuaries is the only way to avoid forest encroachment and poaching inside protected areas.

I live in France and I have some relatives involved in essential oil production here. These production are economically and environmentally suitable, so I am quite interested by this sector to help to protect the forest. France is famous for the fragrance production and the country import today around 50,000 kg of vetiver oil per year. Today this oil is mostly provided by Haïti island production. So I would like to prospect the French market and the opportunity given by native vetiver ecotypes/varieties of Thailand on fragrance market.

The first question I try to answer is: “What is the quality of Thai ecotypes for perfume production and is there a place for them on the French market of fragrance?”. There are many other questions but first I will concentrate on this. So I would like to ask you:

1. Is there some comparative study about the quality of oil extracted from different Thai ecotypes and foreign ones. I already found some information in your work (N. Chomchalow, 2001 but see question 4), but is there more recent works about this topic?

2. Is it possible to buy some samples of the oils extracted of different ecotypes to try to see if French perfume industry could be interested by such products, and where could I buy these extracts (I have some friends in Thailand able to order for me)?

Pictorial Report on the 6th National Conference on Vetiver, Thailand



Venue of the conference: Burapha University



At the registration



Special keynote speech by H.E. Mr. Ampol Senanarong, Privy Councillor



Keynote speech by Mr Suwat Theparuk, Secretary-General of the RDPB



Special keynote speech by Dr. Sumet Tantivejkul, Secretary-General of the Chaipattana Foundation



Token of appreciation presented by Mr. Chalermkiat Sanvises, Advisor of the ORDPB



Panel discussion by Miss Srinith Boonthong and Dr. Narong Chomchalow



Panel discussion by Dr. Pisut Vicharnsorn, Dr. Pitayakorn Limthong,
and Assoc. Prof. Dr. Poonpipope Kasemsap



Concurrent session

Group 1: Study, Experimentation and Reserch Works with
Dr. Piya Chalermglin as moderator



Group 2: Extension and Dissemination Works with
Assoc. Prof. Chalongchai Babpraserth as moderator



Presenting the token of appreciation to the discussants and moderators



Privy Councillor Visiting the Vetiver Lovers Network in the Eastern Region



3. According to your wide knowledge on vetiver, what do you think about the interest of my initiative?

4. I was not able to find this poster: Thubthimthed, S., Rerk-am, U., and Suntornatanasat, T. (2000). Chemical analysis of vetiver oils of five ecotypes. Abstract of poster papers, ICV-2, Cha-am, Phetchaburi, Thailand. Please could you send me this back?

Thank you very much.

Reference:

Chomchalow, N. 2001. The Utilization of Vetiver as Medicinal and Aromatic Plants with Special Reference to Thailand. Tech. Bull. No. 2002/1, PRVN / ORDPB, Bangkok, Thailand.

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Dear Mr. Chaval,

I am pleased to receive your email asking questions about vetiver oil in Thailand. I must confess that it was more than 40 years that I was working on vetiver oil at the Thailand Institute of Scientific and Technological Research. However, I still have some memory of the knowledge I earned during that time, and thus am happy to answer those questions you asked. Here they are:

First, your introductory question: “What is the quality of Thai ecotypes for perfume production and is there a place for them on the French market of fragrance?” The answer is there is no one working on Thai ecotypes for perfume production. The main reason is that at present the Thais grow vetiver mainly for soil erosion protection. However, I just talked to the manager of the Thai-China Flavour and Fragrance Co. Ltd. which used to produce vetiver oil grown in plastic bags. They are now shifting to plastic tube which lasts longer. However, there result is no yet available.

Now, to your 4 questions:

1. Same as the answer above.
2. Since no one is growing vetiver for oil extraction at the moment, thus the answer is no.
3. It is encouraging, and I shall try to convince the people at the Thai-China Flavour and Fragrance Co.Ltd. to continue their work. I shall let you know when they finish the trial which they are doing (i.e. growing vetiver – the ecotype that I brought from Garut in Indonesia some 20 years back).
4. The paper you quote is “Vetiver Oil and Its Sedative Effect” by S. Thubthimthed, K. Thisayakorn, U. Rerk-am, S. Tangstirapakdee, and T. Suntornanaset, presented at ICV-3 in Guangzhou, P.R. China, 6-9 October 2003, not ICV-2 in Cha-am, Phetchaburi. I am trying to obtain digital copy and send it to you later.

Vetiver Network Newsletter*

I suspect that most vetiver users have never looked at the 20 newsletters that we published (snail mail) back in the 1990s. I have made it much easier to do this as I have included a table of contents alongside the link for each newsletter. There is some interesting information, particularly on early research in India and other countries. There are some nice graphs etc. and the data is on the whole reliable. If you have the time, take a look at: http://www.vetiver.org/g/archives_newsletters.htm.

I have at the same time cleaned up the website archives. The starting point for the archives is at: <http://www.vetiver.org/g/archives.htm>. Archival titles are sorted first by country and then by alphabetical order. The majority of the broken links have been repaired. I will try and keep them better up to date in the future. Enjoy!

* By Richard Grimshaw, TVNI Founder and Director, <R.grimshaw@comcast.net>.

Inang Vetiver

On 15 September 2014, there appeared in the Vetiver Blog an interesting dialogue from Ms.Irma Hutabarat <irma@miyarasumatera.org> to Paul Truong <p.truong@veticon.com.au> and Richard Grimshaw <r.grimshaw@comcast.net>. The followings are the dialogue:

Dear Paul and Dick,

I am sending you another publication in "FORUM", about me and Vetiver System. FORUM is a leading magazine in Indonesia.

I have been travelling a lot, around Indonesia, building awareness, campaigning and plantingvetiver.

Since I have been helping the President-elect, Mr. Jokowi with the environmental and green campaign using VS, we now have thousands of volunteers spread around the countries.

We call them "LV"(Laskar Vetiver), means vetiver warrior, communities, universities, private sectors, professional organizations, government officers and leaders of political party too. Some have made groups in social media, and had started planting, I send them the slip and the brochures, they have an enormous amount of enthusiasm and spirit.

I have a lot of local experts now helping me with this great program of VS dissemination. All happened in such a short time, thanks to you both.

David Booth is now part of our Revolusi Hijau too (Green Revolution with Vetiver), he has got his Indonesian citizenship. He told me that he wants to help and be a technical advisor for this movement.

I have spoken to Sinar Mas Group. They own the biggest palm oil plantation and they agreed to do the VS for their CSR for forest rehabilitation and other programs.

We will conduct a FGD with them on the 18 of Sept, this coming Thursday. I will update you later on this.

Viva Vetiver Indonesia,
Best Regards.
"Inang Vetiver"

(Inang means mother in Batak Language)

The Media and the Vetiver Communities gave me that name "hahaha", not the Queen, but The Mother, I like it!!

Privy Councillor Visiting the Vetiver Lovers Network in the Eastern Region*

On 21 June 2014, H.E. Mr. Ampol Senanarong, Privy Councillor and the Chairman of the Committee on the Promotion and Development of the Utilization of Vetiver Grass According to the Royal Initiatives, together with Mrs. Suwanna Pasiri, Deputy Secretary-General of the Royal Development Projects Board (RDPB), the executives of PTT Public Co.Ltd., the officials of the Office of the Royal Development Projects Board (ORDPB), and concerned agencies, visited the Vetiver Learning Centre in the housing compound of Second Lieutenant Surachai Boonkong, the Chairman of the Vetiver Lovers Network in the Eastern Region.

The activities included as follows:

- The cultivation of vetiver grass with mango trees and vegetables.
- The growing of vetiver grass along the edge of the farm pond for soil and water conservation.
- The utilization of vetiver leaves for roofing.
- The mixing of young vetiver leaves with rice husk to make swine feed.
- The cultivation of vetiver grass on paddy-field ridges to prevent soil erosion and absorb humidity.
- The growing of vetiver grass around trees and covering of vetiver leaves around tree bases to be able to hold water and fertilizer longer.
- The promotion and extension of the knowledge on the utilization of vetiver grass.

Afterward, the group went to observe the prevention of landslide along the river banks under the Project on the Application of Vetiver Grass with Mechanical Control and Other Plants to Prevent Landslide in the area of Yan Ree Sub-district in Prachin Buri Province. At the project site, the group was welcomed by Asst. Prof. Dr. Apiniti Jotisankasa, the Committee Member of the Landslide Prevention Project, who gave a presentation on the overall project implementation and showed the group around the project area.

Abstracts of Vetiver Paper

1. Infiltration and Stability of Soil Slope with Vetiver Grass subjected to Rainfall from Numerical Modeling

Authors: A. Jotisankasa ^{1/}, W. Mairaing ^{1/} and S. Tansamrit ^{2/}

^{1/} Department of Civil Engineering, Faculty of Engineering, Kasetsart University, Bangkok, Thailand;

^{2/} Sustainable Energy Foundation, PTT group, Thailand.

Published in: Khalili, Russell & Khoshghalb (Eds.). 2014. Unsaturated Soils: Research and Applications. Taylor & Francis Group, London, ISBN 978-1-138-00150-3.

Abstract:

This paper presents the results of study on influence of vetiver grass (*Chrysopogon zizanioides*) on infiltration behavior and stability of slopes based on unsaturated soil mechanics theory, and numerical model using parameters from past studies. The root-reinforced soil is expected to be of higher strength as well as higher permeability, which would help to reduce runoff by providing more infiltration, thus improving the soil and water conservation. Nevertheless, this would also lead to increase in pore water pressure and possibly decrease in slope stability in some cases. In this research, finite element method was used to analyze infiltration of rain into slope and limit-equilibrium method for slope stability calculation of 2 hypothetical slopes. It was found that for natural soil slope with gradient of 26o, the 2-metre deep vetiver grass roots appeared to increase the pore water pressure only marginally and thus the stability of the soil was improved by reinforcement of the roots. However, for a weathered rock

slope of about 60°, the 0.8 m deep vetiver roots could potentially provide a pathway for water infiltration, and increase the pore water pressure and thus reduced the factor of safety of the slope by about 10%.

2. *Pseudozyma vetiver* sp. nov., a Novel Anamorphic Ustilaginomycetous Yeast Species Isolated from the Phylloplane in Thailand

Authors: Thunnicha Chamnanpa ^{1/}, Pitayakorn Limtong ^{2/}, Nantana Srisuk^{1/} and Savitri Limtong^{1/}

^{1/} Center for Advanced Studies in Tropical Natural Resources, National Research University-Kasetsart University, Bangkok, Thailand

^{2/} Land Development Department, Chatuchak, Bangkok, Thailand

Published in: Antonie van Leeuwenkook (2013): 104: 637-644

Abstract:

Three strains representing one novel yeast species were isolated from the phylloplanes of the vetiver grass (DMKU-LV90 and DMCU-LV99^T) and sugarcane (DMKU-SP200) collected in Thailand by leaf washing followed by a plating technique. On the basis of morphological, biochemical, physiological and chemotaxonomic characteristics and the sequence analysis of the D1/D2 region of the large subunit (LSU) rRNA gene and the internal transcribed spacer region (ITS), the three strains were found to represent a single novel anamorphic ustilaginomycetous yeast species in the genus *Pseudozyma*. The name *Pseudozyma vetiver* sp.nov. is proposed for this novel species. The type strain is DMCU-1, V99^T (BCC61021 – CBS12824). The novel species showed phylogenetic relationships to the other members of the genus *Pseudozyma* and to teleomorphic fungal genera, namely *Ustilago*, *Sporisorium* and *Anomalomyces* in Ustilaginaceae, Ustilaginales. The three strains showed identical sequences both in the D1/D2 and ITS regions. The *Pseudozyma* species closest to the novel species in terms of pair-wise sequence similarity in the D1/D2 region was *Pseudozyma pruni* but with 2.3% nucleotide substitutions and 31 gaps out of 691 nt) in the ITS region. The phylogenetic analysis based on the combined sequences of the ITS region and the D1/D2 region of the LSU rRNA gene showed that the novel species was found to be most closely related to *Pseudozyma fusiformata* but with 2.9% nucleotide substitutions in the D1/D2 region and 7.4% nucleotide substitutions in the ITS region.

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To

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