FIRST RECORD ON THE OCCURRENCE OF Q BIOTYPE *BEMISIA TABACI* ON POTATOES IN SYRIA

Azusa Fujiie, [1]Emad Alden Sawas [2] Mohammad Abdul Hadi, [2]Ahmed Bahij Sawas [2] Shigenori Ueda [3] and Keiko T. Natsuaki [4]

[1] Japan International Cooperation Agency (JICA)
Syria Office and Attachment to General Organization for Seed Multiplication (GOSM) in Syria
JICA: P.O.BOX 10012 Damascus, Syria, GOSM: P.O.BOX 5857 Aleppo, Syria
E-mail: fwgh1797@mb.infoweb.ne.jp
[2] General Organization for Seed Multiplication in Syria
[3] National Agricultural Research Center for Kyushu, Okinawa Region in Japan
[4] Department of International Agricultural Development, Tokyo University of Agriculture Japan

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ABSTRACT

In Syria, potatoes are usually infested with whiteflies, such as the sweet potato whitefly (*Bemisia tabaci*). We report the occurrence of a Q biotype of *B. tabaci*, which were collected in potato fields in Syria. The identification of the biotype was confirmed by mitochondrial cytochrome oxidase I (mtCOI) sequence analysis. The occurrence of whiteflies was observed in all of the 11 potato fields investigated from early September 2006, when the investigations in Syria began, to early November 2006, just before harvest. The cultivation system of the potato investigated in this study is generally called "autumn culture potato" because these are planted in August and harvested in November.

Key words: whitefly, identification, mtCOI, insect pest, Aleppo

INSECTICIDAL ACTIVITY OF EXTRACT MIXTURES OF FOUR PLANT SPECIES AGAINST *CROCIDOLOMIA PAVONANA* (F.) (LEPIDOPTERA: PYRALIDAE) LARVAE

Dadang, Nia Yunia, and Kanju Ohsawa[1]

Dept. of Plant Protection, Faculty. of Agriculture, Bogor Agricultural University
Jl. Kamper, Kampus IPB Darmaga, Bogor, Indonesia 16680
[1]Dept. of Bio-Science, Faculty of Applied Bio-Science, Tokyo University of Agriculture
1-1-1 Sakuragaoka, Setagayaku, Tokyo, Japan 156-8502

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ABSTRACT

Vegetable farmers in Indonesia usually use synthetic insecticides to control insect pests. Improper and excessive use of synthetic insecticides cause undesirable effects. Therefore, a search for novel and safer insecticides to conserve our agricultural ecosystem should be made. Previously, botanical insecticide research focused on screening and bioassay of plant extracts and making botanical insecticide formulations containing a single plant extract. Unfortunately, for mass production, the source of plants is sometimes very limited. So, one strategy to overcome the limitation of plant resources is the use of extract mixtures. This study sought to develop an effective extract mixture of four plant extracts and to search for alternatives in cabbage insect pest management by using botanical insecticides. Four plant species, *Aglaia odorata*, *Swietenia mahogani*, *Piper retrofractum*, and *Annona squamosa* were evaluated. Two extracts were combined for each formulation at the ratios of 3:7, 1:1 and 7:3 (w/w). Each combination was bioassayed against *Crocidolomia pavonana* (F.) (Lepidoptera: Pyralidae) larvae using a leaf dipping method. The extract mixtures that resulted in high larval mortality on *C. pavonana* at 0.05% were *S. mahogani* and *A. squamosa* (3:7), *A. odorata* and *A. squamosa* (3:7 and 1:1), and *P. retrofractum* and *A. squamosa* (3:7, 1:1, and 7:3).

Key words: Botanical insecticide, mortality, pest management, plant extracts

POSTHARVEST STORAGE OF TWO STRAINS OF NAM DOK MAI MANGO FROM NORTHERN THAILAND UNDER DIFFERENT TEMPERATURES USING VARIOUS WRAPPING MATERIALS

Than Than Soe,[1] Kaihei Koshio,[1] Peerasack Chaiprasart[2], Hisamitsu Takahashi[1] and Shuichi Iwahori[1]

[1]Dept. of International Agricultural Development, Tokyo University of Agriculture
Sakuragaoka 1-1-1, Setagaya -ku, Tokyo, 156-8502
[2]Faculty of Agriculture, Natural Resources and Environment, Naresuan University,
Phitsanulok, Thailand, 65000

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ABSTRACT

The commercial ripe fruit of two strains of 'Nam Dok Mai' mango (*Mangifera indica* L.), Gold Sritong and Green T4 were stored at 13°C and 20 °C, with various wrapping materials to determine post harvest shelf life and suitable wrapping material. The rate of respiration, ethylene production, and weight loss were significantly decreased at 13 °C storage as compared with those at 20 °C. Regardless of strain and temperature, the lowest rate of respiration and weight loss were observed for the fruit wrapped with ethylene absorbing bag (EAB) and polyethylene plastic bag (PB) while the highest respiration rate and highest weight loss were found in the control fruits followed by the fruits of EABn (ethylene absorbing bag with needle perforated holes). Chilling injury symptoms were not observed in Nam Dok Mai mango, even when stored at 13 °C. The pH increased gradually particularly in control and EABn at 20 °C while in storage, Brix also increased similarly for both strains. Weight loss, skin firmness and pH were highly correlated with the total shelf life and were likewise affected by storage temperature and wrapping treatments. Significant differences were not observed among the treatments with respect to Brix % and total acid content of the fruit. Regardless of storage temperature and wrapping treatments, Green T4 showed the highest respiration rate and reached the ripening stage earlier than Gold Sritong. There were different respiratory and ethylene production patterns observed in the two strains of Thai mango in this experiment. The lower the storage temperature, the lower the rate of respiration and ethylene production, resulting in prolonged shelf life especially in the EAB and PB wrapped fruits. Shelf life and fruit firmness were better at 13 °C than at 20 °C in all the treatments. The infection of anthracnose disease was more rapid in Green T4 than Gold Sritong stored at 20 °C.

The present research indicated that wrapping with EAB and PB kept the Gold Sritong fruits in good condition up to 28 days at 13 °C as evidenced by the lowest weight loss, lowest respiration rate, firmer flesh and longer shelf life with good quality while Green T4 fruit could only be stored up to 15 days. Nam Dok Mai mango may be stored for 10 days without wrapping even at 20 °C regardless of strains. Therefore, mango fruit wrapping fruit with EAB and PB may offer a practical means of prolonging shelf life up to 14 days longer at 13 °C and 2 days longer at 20 °C, depending on the strain or cultivar.

Keywords: Ethylene evolution, respiration rate, shelf life, storage temperature, wrapping material, ethylene absorbing bag

ANTIBACTERIAL ACTIVITY OF *Pseudomonas fluorescens* RH4003 AGAINST BACTERIAL WILT OF TOMATO

Abdjad Asih Nawangsih[1], Budi Tjahjono[1], Meity S. Sinaga[1], Antonius Suwanto[2], G.A. Wattimena[3], Hiromitsu Negishi[4] and Kazuo Suyama[4]

[1]Department of Plant Protection, Faculty of Agriculture, Bogor Agricultural University, [2]Department of Biology, Faculty of Mathematic and Science, Bogor Agricultural University, [3]Department of Agronomy, Faculty of Agriculture, Bogor Agricultural University, [4]Faculty of Agriculture, Tokyo University of Agriculture.

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ABSTRACT

Six tomato varieties were tested for resistance against bacterial wilt. Among them, Money Maker and San Marzano were relatively susceptible while TM39 and Ratna were relatively resistant. Application of *Pseudomonas fluorescens* RH4003 reduced the disease intensity on Money Maker and San Marzano up to 39%. The application of *P. fluorescens* produced variable response in peroxidase enzyme activity among the varieties. The highest activity was on Money Maker and the lowest was on TM39. Total colonies of *P. fluorescens* RH4003 rif^r isolated from tomato roots were greater than from the rhizosphere. Population density of *P. fluorescens* on Ratna variety was higher than on the other tomato varieties. Combined application of *P. fluorescens* RH4003 with *Bacillus subtilis* AB89 and *B. cereus* L32 produced antagonistic effects while application with streptomycin sulphate produced synergistic effect at 18 and 25 days after transplanting.

Key words: peroxidase, synergy factor, *Bacillus* spp.

FUNGICIDAL ACTIVITY OF *Piper betle* EXTRACT AGAINST *Fusarium oxysporum* f.sp. *vanillae*

Dewa Ngurah Suprapta[1] and Kanju Ohsawa[2]

[1] Laboratory of Biopesticide, Faculty of Agriculture, Udayana University
Jl. PB. Sudirman Denpasar Bali Indonesia. E-mail : biop@dps.centrin.net.id
[2] Department of Bioscience, Tokyo University of Agriculture, 1-1-1
Sakuragaoka, Setagaya-ku, Tokyo 156 Japan.

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ABSTRACT

One of the most destructive diseases of vanilla is stem rot disease caused by the pathogenic fungus, *Fusarium oxysporum* f.sp. *vanillae*. Under favorable conditions for the development of the disease, the vanilla plant may be severely infected and ultimately die.

A previous study found the crude extract of *Alpinia galanga* to possess relatively strong fungicidal activity against *F. oxysporum* f.sp. *vanillae* on PDA and on vanilla seedlings in green house experiments. Five plant species belonging to the family Piperaceae namely *Piper betle*, *P. nigrum*, *P. retrofractum*, *P. cubeba* and *P. decumanum* were studied for their fungicidal activity against *F. oxysporum* f.sp. *vanillae*. The minimum inhibitory concentration (MIC) of the crude leaf extract for each plant was studied on PDA medium to assess its fungicidal activity.

Among the five plant species evaluated, only the 0.15% crude extract of *P. betle* showed strong fungicidal activity against *F. oxysporum* f.sp. *vanillae*, while the other plants did not show fungicidal activity at concentrations from 0.05% to 0.5%. Fungal growth was not observed when *F. oxysporum* f.sp. *vanillae* was grown on PDA amended with 0.4% crude extract of *P. betle*. The 0.5% *P. betle* leaf extract could completely inhibited the fungal growth on PD broth and protected the vanilla stem-cuttings from fungal infection. These results suggest that the *P. betle* crude extract could be used as an alternative natural agent to control stem rot disease on vanilla.

Key words : crude extract, minimum inhibitory concentration.

Abbreviations: MIC - minimum inhibitory concentration, PDA - potato dextrose agar

EFFICACY OF HYDRATED SODIUM CALCIUM ALUMINOSILICATE AND VERMICULITE FOR AFLATOXIN B_1 ADSORPTION IN BLACK TIGER SHRIMP (*Penaeus monodon*) DIETS

Tawadchai Suppadit

School of Social and Environmental Development,
National Institute of Development Administration, Bangkok 10240, Thailand

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ABSTRACT

The effects of hydrated sodium calcium aluminosilicate (HSCAS) and vermiculite minerals as binders were evaluated when added to black tiger shrimp (*Penaeus monodon*) diets contaminated with aflatoxin B_1. Four treatments consisting of balanced diets were as follows: diet 1 as a control diet, free of the toxin and without a binder, diet 2 containing 1% of HSCAS and 500 ppb of aflatoxin B_1, diet 3 containing 1% of vermiculite and 500 ppb of aflatoxin B_1, and diet 4 containing 500 ppb of aflatoxin B_1 without a binder. Shrimps weighing 0.500 g were fed with these diets for a period of eight weeks. The shrimps were stocked in a closed sea water system inside a fiberglass tank. It was observed that the weight gain, average daily gain, feed conversion ratio, protein efficiency ratio, survival rate and aflatoxin B_1 residue in tissues were significantly superior in shrimps fed with diet 2 and diet 3, compared to those with diet 4 ($P<0.05$). These indicators showed lower performance than those obtained from diet 1. Overall, diet 1 had the best performance and a significant difference ($P<0.05$) when compared with other diets. This indicated that aflatoxin B_1 can adversely affect shrimp health and growth. In addition the aflatoxin B_1 residue level in shrimp head plus shell was higher than in shrimp muscle, but was below the FAO/WHO standard of 20.0 ppb. HSCAS and vermiculite were therefore capable of binding some part of the aflatoxin B_1 dose and the use of mycotoxin-binding substances could be beneficial in shrimp raising. The toxin-binding efficacy of the HSCAS was similar to that of the vermiculite.

Key words : mycotoxin, binder, growth, survivability, aflatoxin, residue

Abbreviations: ADG – average daily gain, FCR – feed conversion ratio, HSCAS, PER – protein efficiency ratio

SURVEY OF APHIDS (HOMOPTERA: APHIDIDAE) AND THEIR NATURAL ENEMIES IN NORTH VIETNAM

Warunee Sirikajornjaru[1] and Ha Quang Hung[2]

[1] Plant Protection Departmant, Maejo University, Chiangmai, Thailand
[2] Departmant of Entomology, Hanoi Agricultural University, Hanoi, Vietnam

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ABSTRACT

A survey of aphids and their natural enemies was conducted in 12 localities of agricultural fields and national parks in north Vietnam from March to May 2006. Collections included 16 species of aphids and were identified to belong to three subfamilies: 11 species in Aphidinae, 3 species in Greenideinae, and 2 species in Hormaphidinae. Natural enemies of aphids were found to belong to three groups including 2 species of pathogenic entomophagous fungi, 1 species of parasitoid, and 10 species of predator.

Key words: biological control, pest

AGRICULTURAL INSURANCE IN VIETNAM: SITUATION AND RECOMMENDATIONS

Pham Thi My Dung

Faculty of Agricultural Economics and Rural Development
Ha noi Agricultural University

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ABSTRACT

Insurance is one of the financial system areas, of managing risks. Basically insurance is divided into social and commercial insurance which covers agricultural insurance. Up to now, Vietnam is still an agricultural country with some 14 million farm households living in rural areas. Their livelihood is based on agricultural production. The agricultural production in Vietnam is faced with difficulties and risks, therefore, insurance is one strong solution to help farm households to overcome these. Although insurance, in general, has improved in Vietnam, the agricultural insurance system is still weak.

This research sought to review the current situation of insurance and propose some solutions to develop the agricultural insurance system in Vietnam. This paper covers (i) description of the three main periods of agricultural insurance development in Vietnam. (ii) analysis of the reasons for success and failure of the agricultural insurance from the perspective of the Vietnamese Government, company and farming system; and (iii) proposals to improve agricultural insurance in order to reduce risks for farm households and contribute to the development of the rural financial market in Vietnam.

Key words: insurance product, risk management, mutual and voluntary insurance.

NUTRIENT RECOVERY IN AN ARTIFICIAL INTEGRATED CULTURE SYSTEM BASED ON FRESHWATER PRAWNS (*MACROBRACHIUM ROSENBERGII),* LETTUCE (*Lactuca sativa*) AND FERTILIZERS

[1]Khoda Bakhsh, H., [2]Christianus, A., [2]Alimon, A.R., [2]Khanif, M.Y., [2]Aizam, Z. A., [3]Rashid Shariff

[1]Faculty of Agrotechnology and Food Science,
Universiti Malaysia Terengganu, Mengabang Telipot, 21030 Kuala Terengganu, Malaysia
[2]Faculty of Agriculture, [3]Faculty of Engineering, Universiti Putra Malaysia,
43400 Serdang, Selangor, Malaysia

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ABSTRACT

The concentration and recovery rate of nutrients in different compartments of an integrated culture system were evaluated during a 60-day culture period. *Macrobrachium rosenbergii* were placed in tanks at a stocking rate of 380-400 m^{-3} and all tanks were aerated to stabilize dissolved oxygen. N, P, K, Mg, Zn, Mn, Cu and Ca in water demonstrated a significant quadratic response and increased within the culture period. The accumulated range and biological availability of macro and microelements in lettuce, root, freshwater prawn (*M. rosenbergii*) tissue and sediments indicated that N accumulated more in lettuce and prawn tissue rather than sediments. P does not get accumulated, however its recovery rate was high in sediments > prawn > lettuce tissue. The highest recovery rate of K was observed in lettuce > prawn > sediment (mobile). The retention rate of Mg was equal in lettuce and prawn tissue and that is higher than sediments . Minor and trace elements (Fe, Zn, Mn and Cu) were accumulated mainly in sediments followed by lettuce and prawn tissues (immobile). Ca levels were higher in lettuce and prawn tissues when compared to sediments. The input, constant concentration and removal of nutrients by lettuce, prawn and sediment in different media were considered as an artificial model to obtain the most sustainable culture system and fate of nutrients in aquatic species and environment.

Key words: lettuce, integrated culture; nutrient recovery, recirculating system

Abreviation: FW – fresh water, LF- liquid fertilizer, CM – chicken manure

STAKEHOLDER ANALYSIS APPROACH TO NATURAL RESOURCE MANAGEMENT PLANNING

Linda M. Peñalba, Henry M. Custodio, Flordeliza A. Sanchez, and Aida O. Grande

Institute of Agrarian and Rurban Development Studies (IARDS),
College of Public Affairs, University of the Philippines Los Baños

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ABSTRACT

The competing nature of resource uses and the multiplicity of resource users make natural resource management (NRM) planning complicated. The utility of a particular resource to the multi-stakeholders vary depending on the resource component that is of interest to them and the social, economic and environmental value that such resource generates. For instance, the priority concern of upland farmers is to draw economic value from the forest lands for subsistence while others who are not economically dependent on the forest would prefer to preserve its use for its aesthetic value Informed decision on the appropriate NRM strategy should be based on the nature and the extent of stakeholders' dependence on the resource, the state of the resource that is most useful to them and should take into consideration the social, economic and environmental implications of alternative programs that will be introduced. Participatory rural appraisal (PRA), generally done through public consultation, is the methodology commonly used to generate such information. An alternative approach that was recently found to have greater application in NRM planning is Stakeholder Analysis.

This paper presents the results of stakeholder analysis conducted in the upland and coastal zones of Sibonga, Cebu for agroforestry and coastal resources management. It also shows the potentials of stakeholder analysis as a tool for soliciting stakeholders' perception about the utility of the resource and their perceived roles and responsibilities in NRM as well as the importance of multi-stakeholder participation in making decisions about appropriate NRM strategies.

Key words: Stakeholders, community-based resource management, Sibonga, Cebu

Abbreviations: NRM - natural resource management, PRA - participatory rural appraisal

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Pham Thi My Dung

Faculty of Agricultural Economics and Rural Development
Ha noi Agricultural University

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