

O-1**Cleansing Lotion Containing Tamarind Fruit Pulp's Extract: II Study of Cumulative Irritation Effects in Human**

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Background: Cleansing lotion containing extract of tamarind's fruit pulp was developed to provide skin lighter effect. Skin irritation may occur due to keratolytic effect of alpha hydroxyl acids (AHAs) in the tamarind's fruit pulp extract.

Objective: To assess the cumulative irritation effect of cleansing lotion containing tamarind fruit's extract with 2% w/w tartaric acid on human skin compared with placebo product, and de-ionized water.

Methods: The study design was a single-blinded, randomized side of arm, and controlled study. Three samples including test product, placebo product, and de-ionized water were repeatedly applied on inner forearm of 15 healthy females (with aged 28.3 + 3.1 years) for 30 minutes daily for 5 days under semi-occlusive patch. Skin irritation was measured by using visual scoring and instruments such as Tewameter[®] and Mexameter[®]. All measurements were performed prior to application of samples at every day from day 1 till day 5. Final measurements were performed after last application for 3 days (day 8).

Results: The results obtained from the visual scoring scale indicated no irritation signs and symptoms of test product. Mean differences of TEWL and erythema values between test product and de-ionized water, and between test and placebo products were not statistically significant ($p>0.05$).

Conclusions: These findings indicate a preliminary safety evidence of our developed cleansing lotion containing the natural AHAs and can be used as cumulative evidence for supporting the future home use study of this product in human.

Keywords : Cleansing lotion, Tamarind, skin irritation

O-2**Percutaneous Permeation of Parabens Through Shed King Cobra Skin Compared to Human Skin**

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The *in vitro* transdermal permeation of methylparaben (MP), propylparaben (PP) and butylparaben (BP) through shed king cobra skin and human skin using side by side diffusion cell was carried out. The solubility in citrate PBS and distribution coefficient of these 3 parabens were evaluated. The results showed permeation profiles as straight line ($r^2 >0.99$) that plotted between accumulation amount (μgcm^{-2}) and experiment time (h) of MP, PP and BP. The inter-specimen variation of shed snake (3.9-19.9%) was lower than human skin (31.1-41.1%) with small lag times. The permeability of MP, PP and BP across through shed king cobra skin was similar human skin (1.2-2.6 times). The permeation of parabens was correlated with their distribution coefficient. May be the route of parabens across through membrane is lipid

pathway. This study confirms shed king cobra was properly to use for parabens *in vitro* permeation study.

Keywords : *In vitro* permeation, shed king cobra skin, human skin, parabens

O-3**Market Design of a Skin-mud Pack Cosmetic**

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A market design of a mud pack skin product from Ban-dung, Udonthani, as a local product for commercially available was investigated. Mud pack products used as skin care purposes are not widely known in Thailand despite their benefits as skin moisturizing and pH adjusting effects. This study was aimed to gather the opinions of the potential customers for design the market of mud pack products in KK municipal area. A structured interview form was designed, tested outside the study area, adjusted, and used to gain information from customers at selected beauty salons and spas in Khon Kaen municipal. A total of 200 interviewers, 85% female, 52% being 20-29 years old, 47.5% with monthly income of less than 10,000 Bahts, and 67% using skin pack products once a month, was interviewed. The intention for use of mud pack products was for skin care (69%). The interviewers stated that the price of the product should be less than 500 Bahts (64%); local-made but international band required (58%); product quality concerns (78.3%); supermarket display (65.5%) and that beauty salons were the place of information providers of these products (33.8%). The markets of Ban-dung mud pack products for Khon Kaen municipal, could be divided into 2 group; working women/men for beauty salons or spas. For working women, a demand for small packs with limited budgets, quality and noble product of mud pack from local production was identified. A display in supermarkets with information leaflets was also required. For beauty salons, or spas, where customers gain information of the products, a demand for large size pack with our brand name at a low-cost with useful information provided on leaflets is required.

Keywords : Skin-mud pack, Salt mud, Market design

O-4**Screening for Estrogenicity of *Kaempferia parviflora* rhizomes**

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Kaempferia parviflora, or called 'Krachaidum' in Thai (KD), is a medicinal plant. Its rhizomes have been purposively used for health promoting and illness treatment, including anti-inflammation, health stimulation, anti-colic disorder, health promotion, and aphrodisiac properties. The usage of KD rhizome based products for health beneficial purpose has been nation-wide expanded. Although, some studies on KD were successfully performed, but unfortunately, only a few studies focusing on biological activities for anti-inflammatory and anti-microbial effects have been conducted. Therefore, the investigation of other biological effects of KD rhizomes is needed to establish useful data regarding the folk medicinal wisdom. This present study aims to

investigate the estrogenic and anti-estrogenic effects of KD crude extracts (KDME_50 and KDME_95) and major chemical constituents (5,7-dimethoxyflavone (DMF), 5,7,4'-trimethoxyflavone (TMF)). Using breast cancer cell lines (MCF-7 and T47D) and colorimetric assay, estrogenic, and anti-estrogenic screening is performed using concentration ranges 0.3-10 μ g/ml for KD crude extracts and 0.02- 200 μ M for DMF and TMF. The estrogenic, synergistic and anti-estrogenic effects are expressed as estradiol equivalent concentration (E2 eq.). The results show weak estrogenic effects of KDME_50 and KDME_95. However, at concentration range 0.3-10 ppm, they potentially synergize the estrogenic activity of estradiol (positive control) with dose-response dependent manner. Among them, the estradiol synergistic effect of KDME_95 (E2 eq. 120-1200 pM) is greater than KDME_50 (E2 eq. 150-250 pM) at concentration of 1.25 -5.0 ppm. Moreover, the cytotoxicity of KDME_50 and KDME_95 were demonstrated when concentration greater than 100 ppm, compared to the control. Both DMF and TMF showed moderate estrogenic activity. TMF shows strongly synergistic estrogenic activity of estradiol at concentration range 0.02-200 μ M. In contrast, the estrogenicity of DMF is concentration dependent manner by expressing anti-estrogenic at low concentration (0.02-2 μ M). The maximum of synergistic estrogenic effects are found at concentration of 200 μ M DMF and of 20 μ M TMF with E2 eq. 168 and 850 pM, respectively. This study has demonstrated different degrees of estrogenic activity among *K. parviflora* crude extracts and major compounds.

Keywords : MCF-7, T47D, estrogenicity, estrogenic synergistic, methoxyflavones, and *Kaempferia parviflora*

O-5

Effect of a Participatory Intervention in Diabetes Prevention Program on Health Belief

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Despite diabetes screening targeted at the high-risk populations is currently covered under the universal health care coverage policy, nearly half of the Thai diabetes patients are left undiagnosed. The primary prevention of diabetes requires community participation to achieve the set target. Pharmacists working in the primary health care team (PHCT) should realize the need for a participatory intervention in doing the diabetes prevention program. This study aimed to determine the effect of the participatory intervention on disease knowledge and awareness, perception toward the screening benefit, and the number of screened population as a consequence.

A quasi-experimental study was conducted during September 2004 to August 2005. The study participants aged 41-60 years and never screened for diabetes participated in the five-step program including: 1) community health need assessment, 2) partnership establishment, 3) health and education action planning, 4) implementation, and 5) evaluation. People in the intervention community ($n = 93$) have received information to assess their needs. They negotiated with PHCT to set up the partnerships in three stages. The participants were elucidated diabetes knowledge by PHCT at the first negotiation. They might exchange the knowledge among themselves at the second and third negotiations with PHCT consultation. The knowledge contents included the diabetes causes, signs and symptoms, complications, risk factors, and benefit of the screening. The control community was matched to the intervention community by size of village and distance from primary care centers ($n = 93$). After the intervention was complete, all participants ($n = 186$) were interviewed using a structured questionnaire measuring knowledge, risk perception, screening benefit perception, and screening use.

There were no significant differences between the two communities in demographic and socioeconomic profiles. Knowledge and awareness of diabetes were significantly greater in the intervention group. People in the intervention community perceived the screening benefit and barrier coping with the significantly greater scores than in the control. An increase in the screening rate was significantly higher in the intervention community (from 10 to 75%) than in the control (from 10 to 55%). The results imply that an integration of community participation with the PHCT activities on the diabetes prevention program could enhance diabetes awareness of the people and encourage them to control their own health.

Keywords : participation, diabetes, prevention, health belief

P-1**Tissue Culture of *Bacopa monnieri* and Production of Pseudojujubogenin**Sirilak Kamonwannasit^a, Waraporn pootalun^b

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Bacopa monnieri was studied in vitro using leaf and stem explants on Murashige and Skoog medium supplemented with different of auxins and cytokinins. After four weeks cultures 100% of callus formation was obtained from media supplemented with 1 mg/l 2,4-D and 1 mg/l Kin and 70% of shoot formation from media supplemented with 1 mg/l BA and 0.5 mg/l NAA using stem explants. Leaf explants cultured on media containing TDZ0.1 mg/l gave highest number of shoot reached 142.5 shoots/explant. The stem explants from medium with TDZ 0.5 mg/l contained highest level of pseudojujubogenin (30.62 \pm 1.29 mg/g dry wt.) and callus culture from medium supplemented with 1mg/l Kin and 0.5 mg/l 2,4-D contained pseudojujubogenin 9.29 \pm 1.62 mg/g dry wt.

Keywords : *Bacopa monnieri*, pseudojujubogenin, callus

P-2**The Effect of Coffee-herbal Cream Along with Massage and Body Wrap on the Orange-peel Skin (cellulite)**Jarunee Hongthai^a, Watcharee Khunkitti^b

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Objectives: To formulate caffeine-herbal cream and to investigate the Volunteers' satisfaction of coffee-herb cream for treatment of cellulite.

Design: 18 female volunteers between 22 to 55 years old, having the body mass index between 18 and 29.9. (Classification WPRO,2000) and suffered from second-stage cellulite were participated using bilateral pair comparison study. **Setting:** Chaiyaphum General Hospital. **Intervention:** Either Coffee-herbal cream or placebo was randomly assigned on right or left thigh. After applied the sample, trained therapists gave stroking, pounding and lymphatic massage in each thigh. Then, using cling film to wrap around the thigh for 30 min. The following parameters were investigated before and after using the sample and placebo on day 0, 5, 10, 15 and after washout 15 days period; thigh circumference, skin appearances using descriptive questionnaires by a trained evaluator and acceptance test by volunteer panels.

Outcome measures: Acceptance test revealed that the volunteer preferred the caffeine-herbal cream than placebo in all aspects excepted for it thickness.

Keywords : orange-peel, satisfaction, coffee-herbal-cream

P-3**Effect of Curcumin on Cytochrome P450 Enzymes in Social-Isolated Mouse Liver**Hu Ying^a, Kanokwan Jankamjorn^{a,b}, Yaowared Sumanont^a, Thewarch Laha^c

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Effect of curcumin on hepatic cytochrome P450 enzymes was investigated by administration of curcumin to social-isolated (SI) mice. The assessment of P450 content and the expression of hepatic CYP1A1 and

CYP1A2 were performed. The P450 content is not significantly different among control, SI, and SI-curcumin treated groups. Social-isolation elevated the expression of CYP1A2, while that of CYP1A1 was not changed. At a daily dose of 100 mg/kg/day of curcumin for 7 days, the suppression of SI-induced CYP1A2 was noted. These observations suggested that CYP1A2 could, at least in part, participate in the pathway of oxidation stress, which was deducted by curcumin.

Keywords : curcumin, cytochrome P450, social-isolation

P-4**Study of Antioxidative Activity of Sesame Seed to Obtain Basic Information for Preparation of Skin Care Products**Panompom Sribuarina^a, Pennapa Phuvarti^b, Supatra Porasupattana^b, Nathida Weerapreeyakul^c

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The skin care products are normally made from sesame oil compared to the uses of sesame cake. In this study, the antioxidative activity of sesame cake as well as sesame oil have been conducted for a comparison aiming to achieve basic information for skin care product preparation possessing antioxidation. Three types of sesame cakes which were white, black and red sesame cakes were studied for their antioxidation. The antioxidation were studied based on 3 different mechanism of antioxidation which are DPPH Radical Scavenging Assay, The Ferric Reducing Antioxidant Power Assay (FRAP) and Thiobarbituric acid (TBA). Result showed that only methanolic extract of sesame cake demonstrated radical scavenging activity. Roasting increased the radical scavenger of white and red sesame cake significantly with p value of 0.006 and 0.0003, respectively. Among 3 sesame cakes, the white sesame seed showed the highest radical scavenging ability when the red sesame seed showed the lowest ability. For the inhibition of lipid peroxidation, it was found that both sesame oil and crude extract from sesame cake inhibited lipid peroxidation. The methanolic extract showed better inhibitory effect to lipid peroxidation than sesame oil and hexane crude extract. Roasting was shown to increase the lipid peroxidation inhibitory effect of methanolic extract from white, black and red sesame cake significantly with p values of p < 0.05, 0.02, and 0.00006, respectively. Methanolic extract from white sesame cake exhibited the highest lipid peroxidation inhibitory effect, whereas the lipid peroxidation inhibitory effect of the methanolic extract from black and red sesame cake were not significantly different and unroasted white and black sesame cake showed higher antilipid peroxidation than unroasted red sesame cake. When consider the hexane crude extract, it was found that the roasting decreased lipid peroxidation inhibitory effect significantly with p value of 0.0007. The hexane extract from white sesame cake exhibited the highest lipid peroxidation inhibitory effect. While the lipid peroxidation inhibitory effect of the hexane extract from black and red sesame cake were not significantly different. When consider the unroasted sesame cake, it was found that the hexane crude extract from white and red sesame cake show high lipid peroxidation inhibitory effect. In sesame oil obtaining from roasted sesame seed, it demonstrated increasing of lipid peroxidation inhibitory effect significantly when compared to the unroasted red sesame seed with p value of 0.007. Each sesame oil obtained from roasted sesame seed did not show significantly different in lipid peroxidation inhibitory activity. The sesame oil obtaining from unroasted white and black sesame seed showed higher antilipid peroxidation than unroasted red sesame oil with p value of 0.005 and 0.007, respectively. However, sesame oil and crude extract from sesame cake of all types studied did not possess any reducing power.

Keywords : skin care product, antioxidation, *Sesamum indicum L*

P-5**Factor Affecting Consumers' Behavior and Satisfaction on Thai Traditional Massage at Udon Thani Hospital**Pattawun Pituktum^a, Manita Hanpanitcharoen^b^a Master of Sciences. Independent Study in Aesthetic Sciences and Health, Khon Kaen University.^b Faculty of Pharmaceutical sciences, Khon Kaen University, Khon Kaen, Thailand.

This Study is analysis research which have objective to study on the Factor Affecting Consumers' Behavior and Satisfaction Thai Traditional Massage at Udon Thani Hospital. The samples of the research are clients who have to use Thai Traditional Massage at Udon Thani and never use Thai Traditional Massage at Udon Thani. The sampler of the research is 200 personnel per each and totally 400 samplers. These analysis research tools are Questionnaire and Descriptive Statistic Analysis shown by Frequency, Percentage, Mean and Standard Deviation to analysis data of the factor Affecting Consumers' Behavior and Satisfaction Thai Traditional Massage at Udon Thani Hospital. The Static Inference showing by Chi-Square and Odds Ration to study on the Factor Affecting Consumer's Behavior and Satisfaction Thai Traditional Massage at Udon Thani hospital.

The Factor Affecting Consumer's Behavior of Thai Traditional Massage at Udon Thani hospital found that the sex is not difference and insignificant factor (p-value > 0.05). The differences significant factors (p-value < 0.05) are age, education level, job, income, distance, travel and accommodation, privilege, personal desirability.

The Satisfaction of Thai Traditional Massage at Udon Thani Hospital found that the service fees are satisfaction level and satisfaction of quality service are in high level. The satisfaction for the hospital and circumstance is middle level. The most effect to the Factor Affecting Consumers' Behavior and Satisfaction to choose Thai Traditional Massage at Udon Thani Hospital is reimbursing privilege and the skill of masseurs respectively and the most effect to the Factor Affecting Consumer's Behavior and Satisfaction not choose Thai Traditional Massage at Udon Thani Hospital is inconvenience during service time.

Keyword: Thai Traditional Massage, Satisfaction, Consumers' Behavior

P-6**Situational Study of Traditional Health Care and Healing Among the Prospective of Folk Healers in the Rural Area of Amphur Muang, Khon Kaen Province**Pratakwal Sugsamran^a, Natsjee Nealkaew^b, SomSa Nealkaew^c^a Master of Sciences. Independent Study in Aesthetic Sciences and Health, Khon Kaen University.^b Faculty of Pharmaceutical sciences, Khon Kaen University, Khon Kaen, Thailand.^c Faculty of Pharmaceutical sciences, Mahasarakham University, Mahasarakham, Thailand.

This situational study of traditional health care and healing among the prospective of folk healers in the rural area in 14 sub-districts within Amphur Muang, Khon Kaen province aimed to determine on physical and mental manifestations that rural folk healers are still treating their patients in the area, traditional treatment knowledge transferring, and factors associated with living style among the folk healers. This study subjects were folk healers who have treated their patients at least 20 years and are specialize on 7 types of traditional health cares such as magic, herbal, holy water, ritual activities, massage, mid-wife, and mixed types of their specializes.

The results showed that most of the healers were old age, have low income and have not considered their treatments as one of occupations because

the fee is quite cheap. The healers who have than one abilities, so they treated people as mixed methods. The most popular treatment was ritual activities with other treatment methods. Somehow mid-wife has no responsibilities on delivery but they are taking care pregnant and postpartum women. The most clinical manifestations that the healers could treat were infectious wounds, herpes zoster, fresh wound, and accident. For the herbal treatment in the villages and forest communities were produced as herbal packages such as Phon, Tom, Fun, Luk Khrong, Pock, and Prakop medicines. The healers did not bring any new medications for the treatments except topical remedy. The ritual activities were Lai Phee, Su Khuan, Sa Dor Kor, Soun Kwan, and Lam Phee Fa, somehow patients will seek for treatments from village health offices and hospitals before getting service from folk healers. The reason that patients have both treatments because they believe they would help for sickness relief faster. If the modern treatment could not cure the diseases, they will seek for treatments from folk healers in order to cure diseases and/or have supportive management.

Folk medical treatment textbook written in thamma or thai language on lan leafs have less in nowadays. Transferring folk treatment methods to new generations are 2 healers per a person-generation. As well as they are less people who are indeed interesting on studying traditional treatments as well as it has not much support from government sector for this issue.

The results of attitude on factors associated with health management and disease treatments with living styles of the healers has no statistically significant (p-value > 0.05)

P-7**Slim Club Restaurant Business Plan in Khon Kaen Municipality 2006**Nattira Kleawklaham^a, Wansee Chaichaleampong^b, Sakchai Jaremsiripomkul^c^a Master of Sciences. Independent Study in Aesthetic Sciences and Health, Khon Kaen University.^b Faculty of Pharmaceutical sciences, Khon Kaen University, Khon Kaen, Thailand.^c Khon Kaen, Thailand.

The purposes of the present study were to construct a business plan for SLIM CLUB in Khon Kaen municipality- Khon Kaen Province, to study Khon Kaen municipality citizens' methods and attitudes toward losing weight, and to study the factors affecting decision making in selecting weight-losing methods. The questionnaires consisted of three parts: general information, attitudes toward selecting methods, and the factors affecting decision making to lose weight, and citizen's interest in having meal at the weight loss restaurant. The 400 questionnaires were distributed to gather the primary data from the people who were 20 years old or upper, and lived in Khon Kaen municipality. The secondary data was researched from many different resources such as the information provided on the Internet, research results and etc.

Results : From the study of municipality citizens' methods and attitudes toward losing weight, the most popular method was control of consumption, costing lower than 500 baht for each time and the weight was decreased 1-3 Kg. a month. In addition, most people felt impressive of the result. The people who used to lose weight believed that exercise is the most effective and safe method.

Concerning to factors affecting decision making in selecting weight-losing methods, the safety and side-effects were taken in to consideration of the people who used to lose weight or planed to lose weight in the future.

For SLIM CLUB business plan, the total budget cost was 2,032,000 baht. It could be divided into two proportions: owner's budget cost 832,000 baht, and a bank loan cost 1,200,000 baht. The target customers were the Khon Kaen municipality citizens who had a salary more than 5,000 baht and paid attention to health. Since it was such a new type of business, the marketing mixed would be applied by focusing on public relation, and the following strategies would be implemented: providing high quality, but low

cost products, introducing the weight loss restaurant center through leaflets, advertising boards, and cable televisions, setting the organization's structure, and management systematically, as well as clear manufacturing procedures. After imitating the situation under the 5 years, there was profit information as following classification. In details, Net Present Value was 2,811,333 baht, Internal Rate Return was 34.97% and Pay Back Period was three years, one month and sixteen days.

P-8

Effect of Temperature on Methanolic Fraction Extracted from *Acacia concinna* Pods

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Pod of *Acacia concinna* is a source of saponins consisting of acacic acid lactone and various sugar units. Its methanolic fraction separated from methanolic crude extract has immunostimulating activity. Stability of the fraction in phosphate buffered saline toward thermal treatment was studied in order to providing necessary information for product development. The level of saponins remained during storage at 37, 45, 60 and 75°C was determined using UV-VIS spectrophotometry. It was found that the degradation rate constant of saponins increased with increasing temperature. A kinetic equation was derived in order to predict the influence of storage temperature on the shelf life of saponin content.

Keywords: *Acacia concinna*; stability; saponins; spectrophotometry; temperature

P-9

Febrile Neutropenia in Patients with Acute Leukemia

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Background: Prompt management of febrile neutropenia with broad spectrum antimicrobials can reduce morbidity and mortality in patients undergone chemotherapy. An appropriate regimen of the empirical therapy for neutropenic fever usually varies across health care settings due to different patterns of microbial isolates and antibiotic resistance. This study was aimed to determine an occurrence of febrile neutropenia, the patterns of empirical therapy, and types of micro-organisms found.

Methods: We reviewed the neutropenic episodes in 21 acute lymphoblastic leukemia (ALL) and 66 acute non-lymphoblastic leukemia (ANLL) patients aged > 15 years who were admitted to two tertiary care hospitals during July 2003 to June 2005. Febrile neutropenia was defined as a single episode of body temperature > 38.3 °C or the temperature > 38.0 °C for > 1 hour during a 24-hour period, plus absolute neutrophil counts < 500 cells/mm³.

Results: There were 21 episodes in 18 ALL patients and 83 episodes in 42 ANLL patients. The median days with fever were 10.0 (SD 9.8), and days with ANC < 500 cells/mm³ were 13 (SD 13.8), whereas 58 of the total 104

episodes were the fever of undetermined origin. Sources of infection included sepsis (26.9%), respiratory tract (9.6%) and urinary tract (8.6%). The most common micro-organisms found were *Escherichia coli* (11.5%), coagulase negative staphylococci (6.7%), *Pseudomonas aeruginosa* (5.7%) and *Klebsiella pneumoniae* (3.8%). The first-line empirical antibiotic monotherapy included cefepime (47.1%), ceftazidime (11.5%), cefoperazone/sulbactam (10.6%), and piperacillin/tazobactam (3.8%). Combined therapy of a cephalosporin plus aminoglycoside was common (16.3%). The second-line therapy included amphotericin B (59.6%), vancomycin (24.0%), acyclovir (12.5%) and metronidazole (10.6%). The overall mortality rate was 20% of the neutropenic patients and the mortality rate in the sepsis group (29.6%) was higher than in the other source group (16.2%). Coagulase-negative staphylococci were the most common cause of sepsis (25%).

Conclusions: Our study revealed that bacterial infection was the important cause of death in patients with acute leukemia. Empirical treatment should include broad spectrum antibiotics to cover gram-negative bacteria since they were frequently isolated from these patients. In cases of persistent fever or clinical worsening, adding vancomycin should be considered.

Keywords: febrile neutropenia, empirical therapy, acute leukemia

P-10

Survival Prediction from Hypoalbumin Level in CAPD Thai Patients

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Serum albumin is a strong predictor of outcome in patients with CAPD. A series of data of albumin concentration over time was obtained to determine the prevalence of a persistence of hypoalbuminaemia and whether hypoalbuminaemia was associated with mortality.

This was a retrospective review of 200 adult patients who were one year or longer survivors with CAPD. At our setting, follow-up visits were set for a period of 1 to 2 months. Hypoalbuminaemia during follow-up was defined as serum concentrations of less than 3.0 mg/dL for all of the first four consecutive routine visits. The effect of hypoalbuminaemia at baseline and during follow-up on mortality was examined using a Cox regression model adjusted for diabetes mellitus, technology advancement and important covariates.

Seventy-one patients (35.5%) had hypoalbuminaemia at baseline. The prevalence of a persistence of hypoalbuminaemia during the first four routine visits was 14.5% (29/200). Among those who had hypoalbuminaemia at baseline, 22 out of 71 (31%) patients still had hypoalbuminaemia during these follow-up visits. The median survival times were 29 months for those who had hypoalbuminaemia during follow-up and 61 months for those who had not. Hypoalbuminaemia during follow-up within the first year was significantly associated with increased risk of death with a hazard ratio of 2.0 (95% CI 1.05-3.82), whereas hypoalbuminaemia at baseline was associated with an increase of death by 43 percent (hazard ratio 1.43, 95% CI 0.82-2.50).

Hypoalbuminaemia after receiving CAPD was still common and it is strongly related to an increased risk of death. Interventions should focus on nutritional support.

Keyword : continuous ambulatory peritoneal dialysis, albumin, hypoalbuminaemia, mortality

P-11**Determination of Total Flavonoids, Total Carotenes and Antioxidant Activity of 4 Varieties Lotus Stamens**Nithida Phonkot ^a, Chantana Aromdee ^b^a Graduate student in Master degree of pharmacy program in pharmaceutical, Faculty of Pharmaceutical Sciences, Khon kaen University^b Faculty of Pharmaceutical Sciences, Khon kaen University

The total flavonoids, total carotenes contents and antioxidant activity are determined in methanol extract and mixed solvent extract of 4 varieties Lotus Stamens (*Nelumbo nucifera* Gaertn.). Spectrophotometry and Chromatography techniques were used for measuring total flavonoids, total carotenes contents and the antioxidant activity was determined by DPPH model. The results showed that the total flavonoids, total carotenes contents and antioxidant activity of variety Sattabongkot was different from the other varieties significantly ($p < 0.05$). Total flavonoids (0.57 ± 0.02 %w/w calculated as quercetin) and total carotenes (0.58 ± 0.05 %w/w calculated as β -carotene) of the variety Sattabongkot are lowest, but its antioxidant activity of methanol extract and mixed solvent extract are highest ($IC_{50} = 0.0316 \pm 0.0034$, 1.2900 ± 0.0173 mg.ml⁻¹ respectively). This finding indicated that there are some strong antioxidants in lotus stamens. Thin-layer chromatography fingerprint of Sattabongkot was unique from others.

Keywords : flavonoids, carotene, antioxidant, Lotus Stamens

P-12**Development of a Mud Pack Product From Ban Dung Salt Mud**Aroonsri Priprom ^a, Maneenut Praserthawonsiri ^b, Ladda Wannakao ^c^a Faculty of Pharmaceutical Sciences, Khon Kaen University.^b Master of Sciences. Independent Study in Aesthetic Sciences and Health, Faculty of Pharmaceutical Sciences, Khon Kaen University^c Faculty of Technology, Khon Kaen University

A cosmetic for skin care product from Ban-dung salt mud, Udonthani, was developed into mud pack powder ready for mixing and trying on the skin of volunteers in a double-blinded study. The salt-mud powder, passed the physicochemical and microbiological tests, was mixed with 4 liquids to form pastes which were evaluated the effects on the skin moisture and pH of 40 female volunteers. The study design conformed to the protocol which was approved by the Ethical Committee. A comparison between before and after the application of the pastes indicates that each increased the average skin moisture by 37.5%. Mixing the powder with water (Formulae 1) adjusted the pH of the skin to approach and also increase the moisture of the skin. These effects were found significantly better than others ($p < 0.01$). There were 90% of the volunteers that showed moisturizing effect after using the salt mud pack product (Formulae 1) and 77.5 % pH adjusted to the desired range of the optimal skin pH. Both age ranges of the volunteers using Formulae 1 did show an increase in moisture of the skin. There was 1 volunteer whose initial measurement showed very dry stage of the skin and after the application of the product the skin was very dry and redness. The mud salt powder could adjust the moisture and pH of the skin after the applications without effects of ages. It should be careful for those with very dry skin stage and sensitive skin. It leads to conclude that Ban Dung salt mud has got a potential for development into salt mud products for skin care, particularly for moisturizing and pH adjustment.

Keyword: salt mud, mud pack, Ban Dung, skin moisture and pH

P-13**Type 2 Diabetic Dyslipidemia and Lipid Screening in District Hospitals**Pataranuch Rujirawat ^a, Chulaporn Limwattananon ^b, Piyawan Leelerkiat ^a, Supatra Srivanichakom ^c^a Graduate student, Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, Thailand^b Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, Thailand^c Ministry of Public Health, Nonthaburi, Thailand^{*} Correspondence: supon@kku.ac.th

Objectives: The present study aimed to describe lipid profile among Thai patients with type 2 diabetes and to examine lipid screening and statin therapy in district hospitals.

Methods: The study retrieved data from 2 sources, a health examination survey in 56 primary care settings and 17 hospitals (n=5,093), and medical chart review in 4 district hospitals. The first data set was used for identifying dyslipidemia according to 2006 American Diabetes Association's guideline. The second data set was for determining the prevalence of lipid monitoring and statin therapy.

Results: Among 5,093 patients, 62% had low density lipoprotein (LDL) cholesterol above 100 mg/dl, and 57% had triglyceride above 150 mg/dl. For high density lipoprotein (HDL) cholesterol, 42% of men had the level below 40 mg/dl and 62% of women had the level below 50 mg/dl. In patients who had the LDL cholesterol above 100 mg/dl, 35% had the HDL cholesterol that did not meet the guideline goal (>40 mg/dl) and 19% had neither HDL cholesterol nor triglyceride that achieved the goal (triglyceride <150 mg/dl). In addition, among those with LDL cholesterol above 100 mg/dl, 49.5% had body mass index ≥ 25 kg/m², 43% had hypertension, and 21% had all three risk factors. In the four survey hospitals, lipid screening since being diagnosed were performed only 17-60% during the last 5 years. Among those who had high LDL cholesterol (≥ 100 mg/dl), 64%-91% have never received the statin therapy.

Conclusions: Patients with type 2 diabetes who did not meet the lipid control target remained common (>50%). Lipid monitoring and control through statin therapy were still under-performed in the surveyed district hospitals. This study indicates that lipid management in diabetic patients is suboptimal. Further cost-effectiveness analysis of the routine lipid screening is warranted for an improvement in the primary prevention of cardiovascular disease in the Thai diabetic patients.

Keywords: diabetes mellitus, dyslipidemia, cholesterol, lipid profile

P-14**Early Assessment of Quality of Life After an Open Heart Surgery**Thitima Samkaew ^a, Nutjaree Pratheepawanit ^b, Chulaporn Limwattananon ^b, Cheardchai Soontompas ^b, Suthep Taksinachanekij ^c, Sompob Prathane ^c^a Graduate student, Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, Thailand^b Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, Thailand^c Department of Cardiovascular Surgery, Queen Sirikit Heart Center of the Northeast, Khon Kaen University, Khon Kaen, Thailand^{*} Correspondence: Thiti_mas@yahoo.com

Background: Health-related quality of life (HRQoL) has been becoming increasingly important as the measure of treatment outcomes for clinicians and health care providers. Studies on HRQoL after an open heart surgery in Thailand are limited. Early assessment of HRQoL can provide important information to patient care after surgery. The aim of this study was to evaluate the HRQoL improvements in terms of physical activity, physical health and mental health, depression, and overall utility at 2 weeks after the hospital discharge.

Method: We interviewed 21 adult patients undergone open heart surgery using a set of questionnaires before the operation and 2 weeks thereafter. The measures included Duke Activity Status Index (DASI) with 12 questions, 9-THAI (Thai Health status Assessment Instrument) with 9 questions, The Centers of Epidemiological Studies-Depression Scale (CES-D) with 20 questions and EuroQoL with Visual Analogue Scale (EQ5D VAS). Data were collected during a 2-month period (June-July 2006) by a trained pharmacist.

Results: The age of study participants was 47.4 ± 14.7 years (mean \pm SD). For the physical health, the 9-THAI physical score was 24.4 ± 25.9 (mean \pm SD) before the operation and slightly reduced to 23.4 ± 28.2 at 2 weeks after the operation ($p = 0.885$). The 9-THAI mental scores were 38.4 ± 18.2 and 39.7 ± 17.2 over the same periods ($p = 0.710$). The last three measures of HRQoL were significantly different between the preoperative and the post-operative periods. The physical activity based on DASI became worsened (36.4 ± 14.4 before the operation vs. 25.9 ± 12.3 after the operation, $p = 0.027$). The depression of patients represented by the CES-D scores was 20.9 ± 7.3 and 16.3 ± 6.0 over the same periods ($p < 0.001$). The final overall HRQoL measure, EQ5D-based utility was 67.1 ± 22.6 before the surgery and improved to 74.8 ± 15.4 after the surgery ($p < 0.037$).

Conclusions: Even though the physical activities (based on DASI) of patients declined after the open heart surgery, the mental health of patients in terms of CES-D scores improved over the same period. The overall HRQoL after the open heart surgery significantly improved when measured by EQ5D VAS. The non-significant differences in the 9-THAI scores may result from a small sample size and a relatively short duration of the evaluation after the surgery.

Keywords: Health-related quality of life, open heart surgery, 9-THAI, DASI, CES-D, EQ5D VAS

P-15

Treatment Outcomes in Adult Patients with Acute Myeloid Leukemia

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Background: International literatures reported adult patients with acute myeloid leukaemia (AML) who had received chemotherapy achieved the complete remission by 55-85%. In Thailand, there were limited evidences on effects of the AML treatment. The aim of this study was to describe clinical outcomes resulted from various regimens of the chemotherapy of AML patients aged >15 years.

Methods: This is a retrospective observational study. Data from 112 patients admitted to three tertiary care hospitals during 24 months (July 2003 - June 2005) were collected by trained nurses and pharmacists.

Result: For the remission induction therapy, 14% (16/112) received 3 days of adriamycin and 7 days of cytarabine (ADM "3+7" regimen), 22% (25/112) received 3 days of idarubicin and 7 days of cytarabine (IDR "3+7" regimen), 16% (18/112) received other regimens, and 14% (16/112) received the regimen for acute promyelocytic leukaemia (APL). In these four groups, the complete remission rates were 29, 52, 20, and 73%, respectively, whereas the median survivals were 5.6, 5.4, 3.9, and 18.6 months, respectively. The 6-month and 12-month overall survival rates were 0.53 and 0.20 for the ADM "3+7" regimen, 0.45 and 0.09 for the IDR "3+7" regimen, 0.34 and 0.07 for the other regimens, and 0.75 and 0.75 for the APL regimen, respectively. Relapse

rate was 75% for the ADM "3+7" and 18% for the IDR "3+7". Among those not receiving the induction therapy (n=37/112, 33%), the median survival was 1.3 months, and the 6- and 12-month overall survival rates were 0.2 and 0.05, respectively. Two hospitals preferred the ADM "3+7" (27%) to the standard regimen (23%), while the other preferred the IDR "3+7" regimen (38%). However, the overall survival rates were not different across the three hospitals ($P=0.62$, Log-rank). For treatment complications, 37% of the study patients had febrile neutropenia, 6% had serious bleeding, and 7% had mucositis. Only one patient developed tumour lysis syndrome. Conclusion: This study revealed that adult patients with AML in Thailand had lower complete remission and survival rates than those in the international literatures.

Keywords: acute myeloid leukaemia, AML, treatment outcomes

P-16

Appropriate Screening Tool to Identify Undiagnosed Chronic Kidney Disease in Primary Care Unit

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Chronic kidney disease (CKD) is a growing public health problem. The major outcomes of CKD are loss of kidney function, leading to complications and kidney failure, and development of cardiovascular disease. Adverse outcomes of chronic kidney disease can often be prevented or delayed through early detection and treatment. Earlier stages of CKD can be detected through screening tests. K/DOQI guidelines 2002 recommend that screening tests for CKD are tests for proteinuria and estimation of GFR from serum creatinine by prediction equations.

Proteinuria is most often screened by urinary dipstick test which is limited because of the low sensitivity, specificity and should be confirmed by a quantitative measurement for establish diagnosis. Therefore, dipstick urinalysis has imperfect accuracy in the diagnosis of persistent proteinuria. Furthermore, from the modeling study of the cost-effectiveness of screening for CKD by urinary dipstick test in general population. For person with neither hypertension nor diabetes, the cost-effectiveness ratio for screening vs no screening was unfavorable. There is non cost-effectiveness in screening for CKD by dipstick test for general population because prevalence of CKD is very low.

Currently there is no suitable test for CKD screening in general population, community or primary care unit because there is no cost effectiveness method. Thus, characteristics of appropriate screening tools for chronic kidney disease in primary care should be efficiency, feasibility and low cost to detect undiagnosed CKD.

- 1) Efficiency: screening tool should have ability to discriminate between subjects with and without undiagnosed CKD and also between low and high risk CKD subjects.
- 2) Feasibility: less labor, convenient, does not take time, non invasive and self assessment by population.
- 3) Low assessment cost.

From characteristics of appropriate screening tools for CKD in primary care, a screening questionnaire which include symptoms and risk factors might be an appropriate, potentially cost-effectiveness and noninvasive. Screening questionnaire should include a range of questions covering both symptoms and recognized risk factors for CKD. Statistical method would be used to select high prevalence specific symptoms for kidney disease and risk factors for CKD in the screening questionnaire. The questionnaire will have optimal cut point and scoring in discriminating subjects with and without undiagnosed CKD. Therefore, symptoms and risk screening questionnaire might

be useful as a first step to determine individuals at risk, followed by blood and urinary testing in high risk group.

Keywords: chronic kidney disease, screening tool, primary care unit

P-17

The Choice of Female Consumers Among 3 Styles of Interior Design in Amphur-Muang Khon Kaen

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The research objectives are to study the interior styles of spa's decoration that satisfied the consumer of Khon Kaen municipality and their reasons for their decision to choose any style. The sampling frame of the female population who are employed, aged between 25 to 55 years, amounted to 30,021 persons, and the sample required was calculated as 450 women. A questionnaire was used as research tool and the data analyzed by SPSS computer program and presented as descriptive statistics with Chi-Square test, Independent sample test and percentage.

The conclusion, the interior styles of spa's decoration that satisfied the female consumers are as follows: the first is the vernacular style (170 women, 37.8%), second the tropical style (166 women, 36.9%), third the modern style (95 women, 21.1%) and those with no any idea for all styles (19 women, 4.2%). In terms of satisfaction, divided into 3 levels as much, moderate and a little, the results are summarized as follows: the vernacular style as 52.3%, 46.7% and 1.1%, the tropical style as 55.7%, 43.0% and 1.2% and the modern style as 47.8%, 50.0% and 2.1%. Lastly, the reasons of pleasure in all the interior styles of spa's decoration were as follows: color tone usage, easy looking, good atmosphere, nice furniture, modern, activeness, relaxing, showy, natural looking, Thai looking, etc.

An expert in interior designer gave some added comments about the close agreement between the first (the vernacular style) and the second (the tropical style). This is because both styles have similar color schemes and warm colors from brown finishes such as timber paneling, timber furniture and earth tone artworks and decorative stuffs, furniture reupholsters material look very similar.

Keywords: Interior decoration, Spa

P-18

Short Term Effects of Combination Style Thai Massage to Relieve Head, Neck and Shoulder Pain

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A comparative pre-post one group study was evaluated effects of Thai massage to relieve head neck and shoulder pain. Twenty eight participants were purposive selected from patients at Bang Plama's hospital who had stress score more than 18. Each participant was evaluated on pain and unpleasantness (VAS), blood pressure, heart rate, respiratory rate and percent of oxygen saturation before applying a 30 minute Thai massage. The Thai massage technique used was a combination style of Royal and folk massage techniques. After applying Thai massage blood pressure, heart rate, respiratory rate and percent of oxygen saturated were evaluated at the 5th, 10th and 15th minute respectively. Pain and unpleasantness (VAS) also were also evaluated.

The results clearly show that head, neck, and shoulder pain scores, mean blood pressure, heart rate, after applying Thai massage were significantly reduced ($p<0.05$) as compare to those before massage. However, there was no significantly different in respiratory rate and percent of oxygen saturation between before and after massage.

Keywords: Thai massage, Head Shoulder and Neck Pain

P-19

Quality of Life Assessment in Non Small Cell Lung Cancer Patients Being Treated with Chemotherapy

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คำสำคัญ : มะเร็งปอด คุณภาพชีวิต

P-20**Anti-herpes Simplex Virus Activity of *Alternanthera philoxeroides***

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The increasing clinical use of acyclovir, ganciclovir, and foscarnet against herpes simplex virus (HSV), varicella-zoster virus, and cytomegalovirus has been associated with the emergence of drug-resistant herpesvirus strains. The development of anti-HSV compounds from plants has drawn more attention to overcome the drug-resistant problems. Since *Alternanthera philoxeroides* has been used as antipyretic and dressing for wounds and ulcers in Thai traditional medicine. The present study aims to investigate the antiviral activity of this plant by using cytotoxicity test with MTT-based colorimetric assay. Methanol (MeOH) extract, diethyl ether (Et2O) and n-butanol (n-BuOH) fractions of *A. philoxeroides* were not cytotoxic to Vero cells up to the highest concentration tested (200 μ g/ml). For anti-HSV study, Vero cells were infected with herpes simplex virus type 1 (HSV-1) and then were separately incubated with MeOH extract, Et2O and n-BuOH fractions. At 200 μ g/ml concentration, HSV-1 was not inhibited by the MeOH extract, but partially inhibited by the Et2O fraction. The n-BuOH fraction caused dose-dependent inhibition of virus replication with a 50% cytotoxic activity (CC₅₀) at $793.3 \pm 7.9 \mu$ g/ml, 50% anti HSV-1 activity (EC₅₀) at $87.8 \pm 7.4 \mu$ g/ml, and the therapeutic index was 9.0. 3-O- β -D-glucopyranosiduronate-[28- β -D-glucopyranosyl-oleanolate], a purified major compound from the n-BuOH fraction inhibited the replication of HSV-1 in vitro with CC₅₀ at $570.4 \pm 41.1 \mu$ g/ml, EC₅₀ at $83.2 \pm 15.0 \mu$ g/ml, and the therapeutic index was 6.9. We suggest that *A. philoxeroides* might be a useful medicinal plant against infection of HSV-1.

Keywords: anti-herpes simplex virus, *Alternanthera philoxeroides*, oleanane-type triterpenoid

P-21**Influence of Temperature and Spray Rate on Characteristics of Soy Powder Using Spray Dryer**

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Soy beans are widely used as food, dietary supplement and cosmetic products. Soy powder is used as ingredient for many kinds of soy products because of convenience. Although spray drying is a commonly technique for preparing soy powder, characteristics of the soy powder must be considered. The objective of this study was to determine inlet temperature and spray rate on characteristics of soy powder by using spray dryer. The soy bean milk was prepared from soy bean. Different levels of temperature and spray rate were used according to 3x3 factorial design, first factor, temperature were 130, 140, 150 oC and second factor, spray rate were 15, 25, 35 ml/min and their effect on % yield, moisture content, particle size, dissolve index, quantity of total isoflavones were evaluated compare with soy powder in commercial product. And reproducibility is also determined. The results indicated that quantity of total isoflavones and dissolve index were significantly decreased with the increased inlet temperature ($p < 0.05$). The inlet temperature is not significantly effect on % yield, moisture content and particle size. Increasing spray rate, particle size was significantly increased ($p < 0.05$), quantity of total

isoflavones and dissolve index were significantly decreased ($p < 0.05$). The spray rate is not significantly effect on % yield and moisture content. The reproducibility of the production process was tested and found to be reproducible. It could be concluded that the inlet temperature and spray rate have effected on characteristics of soy powder. The controlled environment during process was required.

Keywords: Soy powder, Spray dry, Inlet temperature, Spray rate

P-22**Comparative Pharmacognostic Studies of Three *Murdannia* Species (Family Commelinaceae)**

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The comparative pharmacognostic studies for three *Murdannia* species (Family Commelinaceae), *M. bracteata*, *M. loriformis* and *M. nudiflora*, were conducted using methods of diagnostic microscopic studies, leaf scraping and leaf clearing; phytochemical methods, physico-chemical value and thin layer chromatography. The methods are useful for the diagnosis. Cutin pattern and macro-hairs are distinguished microscopic characters. The evaluation of phytochemical studies, phenolic contents and thin layer chromatogram, has valuable tools for pharmacognostic identification.

Keywords: Commelinaceae, pharmacognostic studies, microscopic characters, extraction, thin layer chromatography

P-23**Effect of Music Therapy of Depression in the Elderly at the Social Welfare Development Center Ban Buriram, Buriram Province: Comparative Study of Music Therapy Using Buddha Chanting Versus New Age Music**

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This study was designed based on semi-experimental research and composed of two experimental groups and two types of therapy. The objective of this study was to compare depression status of the elderly after listening to Buddha chanting versus new age music. Subjects, hosted by the Social Welfare Development Center Ban Buriram, Buriram Province, were evaluated for their depression status by using Thai Geriatric Depression Scale (TGDS) and found to have low to moderate levels of depression. Study was conducted during the period of June to August 2006. Purposive sampling was performed prior to a random dividing of subjects into two groups (Group I and Group II). During the first round of study, the Group I and the Group II were designed to listen to Buddha chanting and new age music, respectively. TGDS scores were evaluated weekly during a 3-week period which subjects listened to the music one hour per day, three times a week. Mean TGDS scores were analyzed and compared between before, during and after the music therapy. During the first round of study, mean TGDS scores of both groups were found to be significantly decreased ($p < 0.05$) soon after the first week of the study with significant lower TGDS scores in Group I compared to those of Group II in the first and third week. After a two-week wash-out period, these two groups were crossed over in which the first group listened to new age music and the second group listened to the Buddha chanting. Mean TGDS scores were re-evaluated and

higher scores of both groups were observed during the wash-out with no difference among two groups. In the second round of the study, mean TGDS scores of both groups, again, were significantly lower ($p < 0.05$) after listening to the music. However, the mean scores of both groups were not significantly different. This study suggested the effectiveness of music therapy in lessening depression in the elderly especially the Buddha chanting. Results from this study should be applicable as an alternative care for elderly with mild to moderate depression to avoid medication use.

P-24

Anticancer Activity and Apoptosis Induction of Thai Herbal Crude Extracts from Kokputaka Area, Khon Kaen, Thailand

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Fifteen selected plants from Kokputaka area Amphure Phuwiang, Khon Kaen were screened for anticancer activity. The crude extracts of selected plants were prepared from 50% ethanol-H₂O. The anticancer activity was detected from cytotoxicity of crude extracts to human cancer cells (i.e., SK-MEL, KB, BT-549, SK-OV-3, HT-29, and Hep G2) compared to normal cell (i.e., VERO and LLC-PK-1 cells). Cell viability was detected by using Neutral Red assay. Failure of tumor cells to undergo apoptosis was also suggested to indicate resistance of tumor cells to a number of anticancer drug classes. Therefore, induction of apoptosis was used as a pharmacodynamic endpoint of the anticancer activity of the crude extracts *in vitro*. Abilities of crude extracts to induce apoptosis in human cancer cells at concentration of 100 μ g/ml were determined on the basis of changes in nuclear morphology by using DAPI staining. Results showed that crude extract from leave of *Cratoxylum formosum* exhibited cytotoxicity only to HepG2 cell with IC50 of 12 μ g/ml. Crude extract from leave of *Elliptiopsis cherreversis* exhibited cytotoxicity to LLC-PK1 and HepG2 cell with IC50 of 11 and 100 μ g/ml, respectively. And the crude extract from root and stem of *E. cherreversis* exhibited cytotoxicity to LLC-PK1 with IC50 of <5.5 μ g/ml. While the standard anticancer drug, doxorubicin showed cytotoxicity to all cell lines studied with IC50 ranged from <0.5-10 μ g/ml. However, the crude extracts those showed cytotoxicity did not induce apoptosis in the same cancer cell tested. *E. cherreversis* showed cytotoxicity to human hepatocellular carcinoma (HepG₂), and also toxic to normal cell (LLC-PK1). Therefore, there was no indication for biopharmaceutical use. Despite the cytotoxicity of the crude extracts from leave of *C. formosum*, no evidence of apoptotic nuclei was detected in the same cell line. The cytotoxicity of crude extracts from leave of *C. formosum* might be partly due to the presence of some saponin that caused cell membrane lysis. Based on our result, only the crude extract from leave of *C. formosum* that showed to be potential for further study based on its effect to the human hepatocellular carcinoma and non toxic to the normal cells.

Key words: Thai Herbs, crude extract, cytotoxicity, and apoptosis induction

P-25

Study of Antioxidant, Tyrosinase Inhibitory and Cytotoxicity Activities of Crude Extracts from *Terminalia chebula*

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The crude ethanolic extract from fruit body and seed of *Terminalia chebula* as well as aqueous extract of fruit part were screened for antioxidative activity, tyrosinase inhibitory effect and cytotoxicity in various cell lines *in vitro*. The antioxidative activity was performed based on a DPPH assay, while the tyrosinase inhibitory study was conducted based on a decreasing in catalytic activity of tyrosinase when using L-Dopa as a substrate. The cytotoxicity study was performed in noncancerous cell (i.e., VERO cell and LLC- PK-1) compared to cancer cell lines (i.e., SK-MEL, KB, BT-549, SK-OV-3, HT-29, and Hep G2). As the results an ethanolic extract from seed showed the highest antioxidative activity and the highest tyrosinase inhibitory activity with IC50 of 7.68 \pm 0.45 μ g/ml and 525.08 \pm 4.18 μ g/ml, respectively. While standard antioxidants, BHA and BHT possessed IC50 of 2.48 \pm 0.28 and 12.66 \pm 0.79 μ g/ml, and a known tyrosinase inhibitor, trimethyl hydroquinone possessed IC50 of 31.67 \pm 0.87 μ g/ml, respectively. For the cytotoxicity study, 50% ethanol-water extract from fruit showed cytotoxicity against the HepG2 with IC50 of 18 μ g/ml, whereas, doxorubicin was toxic to all cell lines. It was found that the ethanolic extraction of *T. chebula* gave higher activity than the aqueous extraction. Both seed and fruit body of *T. chebula* showed biological activity and safety. Therefore, *T. chebula* possesses potential for biopharmaceutical use.

Keywords: Antioxidant, tyrosinase, cytotoxicity

P-26

Chemical Constituents of Isan Medicinal Plant, *Dioecrescis erythroclada* (Kurz) Tirveng

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Dioecrescis erythroclada (Kurz) Tirveng. (Thai name: Ma-kung-Deang), a member of the family Rubiaceae in the monotypic genus, is a middle tree 6-12 m high, native to topical regions of Asia. The roots and fruits are used in Isan tradition medicine for the relief of stomachache and abdominal pain, and antipyretic purposes. The present study deals with the isolation and structure determination of the polar components from the leaves and branches of this plant. Six glycosides were isolated and assigned as apodanthoside, mossaenoside, benzyl β -D-apifuranosyl (1-6)- β -D-glucopyranoside, oct-1-en-3-ol α -L-arabinopyranosyl (1-6)- β -D-glucopyranoside, phenethyl β -D-apifuranosyl (1-6)- β -D-glucopyranoside and gardenoside, respectively. The structural elucidations were based on analyses of chemical and spectroscopic data.

Keywords: *Dioecrescis erythroclada*, Rubiaceae, Chemical constituents

P-27**A Simple Colourimetric Method for Determination of Mercury(II)**Pradabduang Comeproa ^a, Wirat Ruengsitagoon ^b^a Graduate School, Khon Kaen University, Khon Kaen, Thailand^b Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, Thailand

A simple colourimetric procedure for determining mercury(II) was proposed. It is based on the reaction between 1,5-diphenylthiocabazole (dithizone) and sodium dodecyl sulfate (SDS) in slightly acidic aqueous solution, resulting in an intense dark blue complex with suitable absorption at 490 nm. Under the optimum conditions, a linear calibration graph was obtained over the range 2.0-15.0 $\mu\text{g ml}^{-1}$ ($r^2 = 0.9984$, $n=5$) and detection limit was 0.50 $\mu\text{g ml}^{-1}$. The percentage recoveries of 4.0, 6.0 and 8.0 $\mu\text{g ml}^{-1}$ ($n = 5$) of mercury (II) were found to be 97.68-101.38 %.

Keywords : colourimetric method, mercury (II), 1,5-diphenylthiocabazole, sodium dodecyl sulfate.

P-28**A Simple Spectrophotometric Method for Determination of Folic Acid from Pharmaceutical Formulation**Yupaporn Ariyasura ^a, Nantaporn Hattanat ^b, Wirat Ruengsitagoon ^b^a Graduate School, Khon Kaen University, Khon Kaen, Thailand^b Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, Thailand

A simple spectrophotometric method for determining folic acid was developed. It is based on the reaction between diazotization of the *p*-aminobenzoylglutamic acid obtained after reduction of folic acid and 3-aminophenol, resulting in an orange-yellow complex with a suitable absorption at 460 nm. Under the optimum conditions, a linear calibration graph was obtained over the range 2-20 $\mu\text{g ml}^{-1}$ and the detection limit was 0.36 $\mu\text{g ml}^{-1}$ ($s/n = 3$). The percentage recoveries of the proposed method calculate from 5 replicate measurement of proposed and standard method were found to be 98.43 and 99.40 %, respectively. The propose method has been satisfactorily applied to the determination of folic acid in pharmaceutical formulation.

Keywords : folic acid, spectrophotometric, diazotization, pharmaceutical formulation

P-29**Dispensing pattern for diarrhea of dispensers at drug stores in Vientiane, Laos.**Sommaly Phomtavong ^a, Nutjaree Pratheeepawanit Johns ^b, Wanwilai Laolakkana ^b, Siriluk Jaisue ^b^a Master of Pharmacy Thesis in Clinical Pharmacy, Faculty of Pharmaceutical Sciences, Khon Kaen University^b Faculty of Pharmaceutical Sciences, Khon Kaen University

This research aimed at determining the interviewing for symptoms and the dispensing pattern for simple watery diarrhea without fever and without bloody mucus of dispensers at drug stores class 1 (pharmacist), 2 (pharmacy technician) and 3 (other healthcare providers) in Vientiane Capital, Laos. The counseling of drug use and appropriate self care advice by dispensers were also evaluated. This study was divided into two phases as follows: the first phase, interviewing of dispensers in 124 drug stores and the second phase, collecting data from a simulation situation in 40 randomized drug stores where customers asked to buy medication for diarrhea. The findings of the study showed that most of dispensers were female (84%), the highest level of education was undergraduate (54%) and the mean experience of the drug sellers were 7 to 10 years. From the interview, the dispensers indicated that they interviewed symptoms of the disease prior to drug dispensary (97%). This was found to be only 60% in the real simulation situation and was found mostly in class 1 drug stores. Dispensing patterns reported during the interview were similar to the treatment guideline, which is mainly Oral Rehydration Salts (ORS) (93%) and no antidiarrheal drug. However, antimicrobial drug was still dispensed in 19% of cases. During the simulation situation, all three classes of drug stores dispensed medications differently from stated in the interview ($p<0.05$). Antimicrobial was dispensed mostly (75%) but only 57% of ORS was reported and one store in class 3 additionally dispensed antidiarrheal drugs. Comparing with the standard treatment guideline for watery diarrhea of the World Health Organization, the results showed significant difference of ORS use (62% vs 100%, $P < 0.0001$), antimicrobial or antidiarrheal use (72% vs 0%, $P < 0.0001$). In addition, the study showed that the dispensers gave counseling on drug use, and appropriate self care advice to customers in only 72% and 25% of cases, respectively. Class 1 drug stores gave more counseling than the others. The findings showed that the appropriate drug use for watery diarrhea was still low, especially at the class 2 and 3 drug stores. There should be organized training courses on this topic for dispensers in this area in the future.