

Abstracts

Session 5 Medical, Veterinary and Clinical

Plenary paper

S5.1 Pathogenesis, pathology and parasites : a new look at an old problem

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The problem, though old, is still with us and it is by no means a small one. In spite of considerable knowledge that has been accumulated over the years with regards to the parasites and their life cycles and great advances made in their control, their hosts and their environment continue to succumb to the devastating effects of parasitism. Successful attack and growth of parasites in a suitable host depends upon several factors that affect pathophysiology of infection and the characteristics of the pathogenic parasite that cause infection. The former is dependent on general integrity of the host including, age, sex, race, and the habitat of the host. The latter depends on the mode of action, infectivity, pathogenicity, antigenicity, toxigenicity and organ predilection. Yet another significant aspect of the outcome of infection is determined by host and parasite interactions which are governed by their genomes. The genetic information from both the host and parasite along with the emergence of sophisticated new tools such as microarray technologies has provided better understanding of the interactions between host response and parasite virulence factors. It will be needless to add that molecular knowledge of host-parasite interaction will facilitate targeting new therapeutic approaches. I shall briefly touch upon some of these factors.



Plenary paper

S5.2 Is there a place for basic parasitology in the age of biotechnology ?

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What is the consequence of using biotechnology in parasitology? Will there be a loss of critical basic knowledge as some fear or will biotechnology keep parasitology alive only as a discipline to support the euphoria surrounding it in today's world? How will parasitology survive this onslaught and retain its place in the world of animal and human health sciences? The answer probably lies in between the two extreme views. The advent of PCR has indeed given parasitology a new burst of life and the sudden rush to barcode organisms means that there is a need for skilled taxonomists. Parasitologists must get into the game and utilize these burst of activities to sustain parasitology as a discipline. Biotechnology is necessary and useful to bring product of Science to the people - designer drugs from DNA is an example. The sudden increase in apparently new emerging diseases has further enhanced the need for biotechnology. But this does not mean that the battle to overcome these diseases can be won without knowledge of the pathogen. The many failures and delays in controlling emerging diseases have been mainly due to lack of adequate knowledge of the pathogens causing them. We know that these diseases cannot just appear from nowhere. This again indicates that we need to know something about the lifecycle, habitat, host range and survival requirements of the pathogens. With this knowledge we can use biotechnology to make the appropriate intervention. I would like to reiterate that there is a need for skilled techniques (biotechnology tools) and also basic understanding of the biology and ecology of the parasites in order to control and manage parasitic diseases effectively.

S5.3 Evaluation of anthelmintic effect of cassava (*Manihot esculenta*) leaves on sheep

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Helminths pose as one of the greatest challenges to small ruminant production systems in the tropics. As anthelmintics now have little or no value in controlling helminths due to anthelmintic resistance, novel approaches to worm control are sought. One such idea is the use of cassava or locally known as tapioca leaves fed freshly or as ensiled cassava leaves to small ruminants. In Malaysia, this plant known as 'pokok ubi kayu' is planted for its tubers as a source of starch for commercial use. The leaves can be consumed blanched with rice. Studies done in Cambodia have shown the anthelmintic effect of this plant. Therefore, it is our aim to evaluate the anthelmintic effect of local cassava (*M. esculenta*) leaves available in Malaysia. This study was conducted to evaluate the anthelmintic effect of cassava (*Manihot esculenta*) leaves on sheep. Twenty four cross bred sheep were randomly selected and equally divided into control (n=8), fresh cassava leaves group (n=8) and cassava leaf silage group (n = 8). Faecal egg counts (FEC) using the modified McMaster technique were carried out 3 times per week and the FAMACHA score for assessing clinical anaemia was conducted weekly. From the results, there is a reduction on the faecal egg counts of the animals. This result indicated that feeding fresh and ensiled cassava had an effect of reducing the worm egg counts in sheep. However, further work is needed to reconfirm the effect of cassava on helminth infections of sheep.



S5.4 Severe anthelmintic resistance in a medium-scale commercial goat farm

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Nematode Faecal Egg Count Reduction Test (FECRT) was conducted on a new private goat farm near Ipoh to evaluate the status of resistance to 4 anthelmintics from the major groups of anthelmintics available in Malaysia. The farm had 150 goats of mixed breed and practiced intensive management, whereby animals were not allowed to graze but grass from paddocks were cut and carried. Faeces was used as fertilizer for the grass paddocks. Faecal samples were subjected to McMaster method for worm burden estimation and larval culture for third stage larvae identification. The mean pre-treatment faecal egg count was 5822 e.p.g. It was found that the nematode population was resistant to benzimidazole, levamisole and closantel as the percentage reduction was between 54%-91%. Only macrocyclic lactones could be used for nematode control in the farm (percentage reduction of 99%). *Haemonchus contortus* and *Trichostrongylus* sp. were found in all post-treatment larval cultures, indicating these two species are resistant to all drugs. However, *Bunostomum* sp. was only found in post-treatment larval culture of closantel, indicating it is resistant to closantel. The FECRT is critical for a newly established farm as it will give important information on the worm population and the status of worm resistance as well as the worm species that exists in the farm so that further action can be taken to manage the problem.

S5.5 Growth inhibition of *Plasmodium falciparum* by *Lansium domesticum* leaf extracts

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The declining efficacies of current antimalarials and the potential of phytochemicals for rational drug design has made plants an attractive resource in the search for new medicines for malaria chemotherapy. By tradition, herbal teas made from the leaves and barks of *Lansium domesticum* have been prescribed for the treatment of fevers by traditional medicinal practitioners in certain remote parts of Borneo. In order to investigate for the antimalarial activity of *L. domesticum* leaves, alkaloid-optimised extraction methods were used. The total extract and high alkaloid-containing sub-fractions were tested for malaria-active compounds according to the World Health Organisation (WHO) standard *in vitro* microtest assay using *Plasmodium falciparum* clone 3D7. A preliminary screen of four extracts (total methanolic extract, dichloromethane sub-fraction, ethyl acetate sub-fraction and methanol sub-fraction) was done. The highest growth inhibitory effect was identified in the total methanolic extract and the dichloromethane (DCM) sub-fraction. A repeat assay, in sets of 10 replicates, confirmed that 99 percent of trophozoites failed to mature in the presence of 100 µg/ml of the total methanolic extract, while a 98 percent inhibition of schizont maturation was observed for the 50 µg/ml of the DCM sub-fraction. Confirmation of Plasmodium-active components in *L. domesticum* leaf extracts completes the first phase of work towards identifying intracellular targets that are involved during the process of malaria parasite toxicity in the *L. domesticum* inhibition model.



S5.6 Occurrence of dermatitis among paddy field farmers in four villagers in the Kota Bharu Area, Kelantan

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Dermatitis has been plaguing the farmers in the Kota Bharu area, Kelantan since the late 90s. Dermatitis is an important cause of economic loss to many paddy farmers because fields are left uncultivated due to sores on the farmers hands and feet. It has become such a serious problem that in certain areas farmers were forced to abandon rice growing and opt for tobacco cultivation, resulting in decreased paddy growing. A survey was undertaken to investigate the occurrence, prevalence and causes of dermatitis amongst the paddy farmers in the Kota Bharu area. The results obtained indicate that dermatitis has a prevalence rate of 47.9% amongst the paddy farmers. The paddy farmers are usually infected during the preparation of the fields and during the transplanting stage than other stages of planting and harvesting. The water sources for irrigation are mainly from the river and irrigation canal and are most likely the source of infection. The dermatitis among paddy farmers is most likely a form of cercarial dermatitis and the most likely source of cercariae causing dermatitis among the farmers are probably cattle or the ducks reared in the waterways of the irrigation system. Ducks and cows are the hosts to schistosomes that are known to cause cercarial dermatitis amongst human.

S5.7 Preliminary clinical outcomes of maggot debridement therapy with Malaysian *Lucilia cuprina* larvae

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Maggot Debridement Therapy (MDT) is the clinical application of sterile live maggots to debride intractable wounds. MDT has been used for many years, notably in the West using maggots of *Lucilia sericata*. In this region, MDT using maggots of local *Lucilia cuprina* was first reported by researchers from the Institute for Medical Research, Kuala Lumpur on 3 diabetic patients. A prospective case controlled study comparing conventional debridement and MDT was initiated in Kuala Lumpur Hospital in May 2006. It was conducted on 27 patients, 24 of whom fulfilled the criteria for inclusion. Of the 24 patients, 17 were males and 7 females. The mean age was 54.7 years (30.0-75.6 years). All selected patients suffered from non-healing diabetic foot ulcers. The outcome measurements were categorised into 4 main grades to ascertain effectiveness of MDT. Live sterile second instar maggots of *Lucilia cuprina* were supplied by the Medical Entomology Unit, IMR using standard patent-pending sterilisation procedures. Maggots were applied directly onto wound areas at a dosage of 10 larvae/cm² and bandaged with normal gauze. Maggots were left in the wound for 48-72 hours. The mean length of time for MDT was 11.7 days. Based on the prescribed outcome measurements, 13/24 (54.2%) were healed, 6/24 (25%) unhealed and 4/24 (16.7%) others (patient withdrawal, discontinuation, death etc.). Patient acceptance of MDT was excellent. No side-effect was reported, except in 1 patient (from "Others") who complained of pain. Major problems encountered were: long ward stay for MDT patients and lack of trained staff to perform MDT.



S5.8 Detection of anti-bacterial agent(s) from larvae of *Lucilia cuprina* - a preliminary study

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Maggot therapy is known to help debriding wounds faster and less painful than the conventional method. It was believed that the maggots not only consume necrotic tissues, but also secrete anti-bacterial agent(s) that can prevent and stop infection from spreading to other areas. Since some patients are deterred by maggot therapy other methods without using living maggot had to be studied. Maggot paste and secretion has been used to determine its antibacterial properties in this study. Two different types of bacteria were used, *Staphylococcus aureus* and *Acinetobacter baumannii* as both species were always found in infected patient wound thus worsening the patient's condition and lead to antibiotic resistance. Two methods were employed to measure the antibacterial properties; (i) the well method on agar to measure inhibition zone and (ii) the optical density (OD) reading for bacterial growth, based on modified method from Minimum Inhibition Concentration (MIC). The results for well method for *Staphylococcus aureus* and MRSA both gave 15mm in diameter (inhibition zone) for both secretion and maggot paste while positive control using ethanol gave 12mm and 10mm inhibition zone, respectively. However, with *Acinetobacter baumannii*, no inhibition was detected either using secretion or paste.

S5.9 Infracommunity changes of rat endoparasites and the wild rat population from the Endau Rompin National Park, Johor

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In view of the steady increase of human activities within the Endau Rompin National Park, a follow-up study on wild rats and their endoparasites was carried out to observe changes to their population composition and distribution. Trappings was concentrated within the vicinity of the Lubuk Tapah base camp and the surrounding primary forests for six months. A total of 128 rats, consisting of eight rat species, were captured. *Maxomys surifer*, *Maxomys whiteheadi*, *Rattus exulans*, *Rattus rattus diardii* and *Rattus tiomanicus* were newly recorded from the area. Postmortem examination found 90.63% rats harboured endoparasites, with 29 endoparasite species recovered. Endoparasites of the following were new observations to the area: *Angiostrongylus malaysiensis*, *Capillaria hepatica*, *Cyclodontostomum purvisi*, *Gongylostrongylus neoplasticum*, *Fibricola ramachandrani*, *Globocephalus connorfilii*, *Heterakis spumosa*, *Macrostrongylus ratti*, *Maxomystrongylus* sp., *Nippostrongylus brasiliensis*, *Orientostrongylus* sp., *Paraheligmoneides* sp., *Physalopteridae*, *Rattuststrongylus odontoconus*, *Rattustrogylus rotundoconus*, *Rctularia tani*, *Rodentolepis nana*, *Strongyloides* sp. and *Syphacia muris*. Present observations differed significantly from earlier survey due to the recent intrusion of commensal rats, particularly *Rattus tiomanicus*, into the park. Visible changes in both the rat and their endoparasite fauna within the park offers a unique opportunity to study the long-term effects of continuous interactions between forest and commensal rats within a small area for future biomedical surveillance and environmental monitoring.



S5.10 Predator control at Zoo Negara from 1983 to 2005

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Predator control on zoo, birdparks and in the resorts where wildlife are kept plays a major role in preventive medicine. Some modern zoos even employ specialised predator control officers. Most zoos are faced with predator problems, but the severity and type of problems will vary from zoo to zoo within a region. Zoo Negara was carved from jungle and in the early 1960's disturbance caused to the surrounding ecosystem by various human activities created a serious predator problem in the zoo. Shrinkage and loss of habitat caused encroachment of predators such as wild pythons, monitor lizards and palm civets into the zoo area. Some of the reptile predators identified were endangered species which were kept in the zoo collection for exhibition. In the intervening years especially in the early 1980's this problem assumed serious proportions. During this period, in addition to the predators, the presence of large numbers of crows and rats and the intrusion into the zoo compound of stray cats and the occasional dog caused grave concern. The proliferation of insects, especially mosquitoes further increased this concern, as the presence of predators and potential vectors of disease presented an undesirable situation. Therefore to counter this situation concerted efforts were made to capture or trap insects of medical importance and predators including wild palm civets, rats, stray cats and dogs. Animals caught during the predator reduction programme were screened for the presence of ectoparasites, blood parasites and other organisms. The result of these efforts will be discussed.

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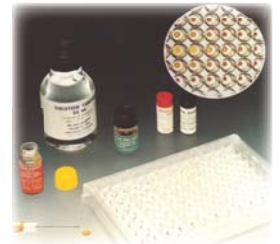
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