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KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

Mengabang Telipot, 21030 Kuala Terengganu

Institut Oseanografi

Rujukan kami : KUSTEM/INOS/2-2/2/3 Jld.3 (1)

Tarikh : 25hb. Mac 2003

Pn. Marinah binti Ariffin
Jabatan Sains Kimia
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia

Assalamualaikum Warahmatullahi Wabarakatuh / Salam Sejahtera.

Puan,

PERMOHONAN KELULUSAN UNTUK PINDAHAN PERUNTUKAN (VIREMENT) DARI KOD PERJALANAN (2100) DAN UPAH (2900) KE BAHAN DAN BEKALAN (2700) UNTUK PERUNTUKAN 54083

Dengan segala hormatnya saya merujuk kepada perkara di atas dan surat puan bil. bertarikh **19 Mac 2003** adalah berkaitan.

2. Adalah dimaklumkan Mesyuarat Jawatankuasa Penyelidikan KUSTEM kali ke-10 yang diadakan pada 13hb. Mac 2003 yang lalu telah memutuskan bahawa sebarang permohonan untuk pindahan peruntukan jangka pendek hendaklah dihantar terus ke Timbalan Dekan Penyelidikan di fakulti masing-masing. Surat berkenaan penyerahan kuasa meluluskan pindahan jangka pendek kepada Timbalan Dekan Penyelidikan di fakulti masing-masing ini telahpun diedarkan. (Sila rujuk surat kami bil. KUSTEM/INOS/2-2/2/3 Jld.2 (64) bertarikh 17hb. Mac 2003).

3. Sehubungan itu, puan hendaklah mengemukakan semula permohonan ini terus kepada Timbalan Dekan Penyelidikan di FST. Sekian untuk makluman dan tindakan pihak puan seterusnya.

Terima kasih.

Yang menjalankan tugas,

(ZUL-ATFI BIN HASHIM)

Pegawai tadbir
Sekretariat Penyelidikan

s.k. - Timbalan Dekan Penyelidikan, FST



- Fail



KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

21030 Mengabang Telipot, Kuala Terengganu

*Jabatan Sains Samudera
(Department of Marine Science)*

Tarikh : 25 Mac 2003

Bendahari
Kolej Universiti Sains dan Teknologi Malaysia

Sekretariat Penyelidikan
Institut Oseanografi
Kolej Universiti Sains dan Teknologi Malaysia

↗ Timbalan Dekan
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(UP. Prof. Madya Dr. Nakisah Mat Amin)

Tuan/Puan

**PERSETUJUAN PENERIMAAN KUASA UNTUK MENGURUSKAN PERBELANJAAN
PERUNTUKAN KEWANGAN PENYELIDIKAN DARI DIREKTORAT
BIOTEKNOLOGI KEBANGSAAN**

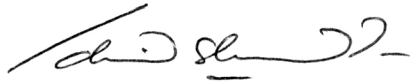
Perkara di atas dan surat daripada Dr. Mohd Effendy Hj. Abd Wahid (KUSTEM/FST/BIO/NBD (01-03) bertarikh 27 Februari 2003 adalah dirujuk.

Adalah dengan ini saya bersetuju untuk menguruskan perbelanjaan di bawah projek penyelidikan yang bertajuk "**Development of respiratory and gastro-intestinal mucosal immunity following administration of *Pasteurella multocida* B:2 antigens**" sehingga kepulangan Dr. Mohd Effendy Hj. Abd. Wahid daripada Korea. Oleh itu segala urusan yang bersangkutan dengan projek ini bolehlah dirujuk kepada saya.

Sekian untuk makluman dan tindakan daripada pihak tuan/puan.

Terima kasih.

Yang benar,



(Dr. Ahmad Shamsuddin Ahmad)
Jabatan Sains Samudera
Kolej Universiti Sains dan Teknologi Malaysia

s.k Prof. Dr. Noor Azhar Mohd Shazili
Dekan FST

Prof. Dr. Chan Eng Heng
Ketua Jabatan Sains Biologi

Dr. Mohamed Kamil Abdul Rashid
Ketua Jabatan Sains Samudera

Prof. Dr. Mohd Zamri bin Saad
Dekan, Fakulti Perubatan Veterinar UPM *cum* Ketua Projek

Dr. Mohd Effendy Hj. Abd. Wahid
Jabatan Sains Biologi



KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

21030 Mengabang Telipot, Kuala Terengganu

*Jabatan Sains Samudera
(Department of Marine Science)*

Tarikh : 25 Mac 2003

Sekretariat Penyelidikan
Institut Oseanografi
Kolej Universiti Sains dan Teknologi Malaysia

➤ Timbalan Dekan
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(UP. Prof. Madya Dr. Nakisah Mat Amin)

Tuan/Puan

**PERSETUJUAN PENERIMAAN KUASA UNTUK MENGURUSKAN PERBELANJAAN
PERUNTUKAN KEWANGAN JANGKA PENDEK VOT 54040 DAN 54041**

Perkara di atas dan surat daripada Dr. Mohd Effendy Hj. Abd Wahid (KUSTEM/FST/BIO/Short Term (02-03) bertarikh 27 Februari 2003 adalah dirujuk.

Adalah dengan ini saya bersetuju untuk menguruskan perbelanjaan di bawah peruntukan jangka pendek Vot 54040 dan Vot 54041.

Sekian untuk makluman dan tindakan daripada pihak tuan/puan.

Terima kasih.

Yang benar,

(Dr. Ahmad Shamsuddin Ahmad)
Jabatan Sains Samudera
Kolej Universiti Sains dan Teknologi Malaysia

s.k Dekan FST
Ketua Jabatan Sains Biologi
Ketua Jabatan Sains Samudera



Rujukan kami : KUSTEM/INOS/2-2/2/3 Jld.3 (2)

Tarikh : 25hb. Mac 2003

Cik Noor Azliza Che Mat
Jabatan Sains Komputer
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia

Assalamualaikum Warahmatullahi Wabarakatuh | Salam Sejahtera.

Puan,

PERMOHONAN KELULUSAN UNTUK PINDAHAN PERUNTUKAN (VIREMENT) DARI BAHAN DAN BEKALAN (2700) KE KOD PERJALANAN (2100) UNTUK PERUNTUKAN 54072

Dengan segala hormatnya saya merujuk kepada perkara di atas dan surat puan bil. bertarikh **22 Mac 2003** adalah berkaitan.

2. Adalah dimaklumkan Mesyuarat Jawatankuasa Penyelidikan KUSTEM kali ke-10 yang diadakan pada 13hb. Mac 2003 yang lalu telah memutuskan bahawa sebarang permohonan untuk pindahan peruntukan jangka pendek hendaklah dihantar terus ke Timbalan Dekan Penyelidikan di fakulti masing-masing. Surat berkenaan penyerahan kuasa meluluskan pindahan jangka pendek kepada Timbalan Dekan Penyelidikan di fakulti masing-masing ini telahpun diedarkan. (Sila rujuk surat kami bil. KUSTEM/INOS/2-2/2/3 Jld.2 (64) bertarikh 17hb. Mac 2003).

3. Sehubungan itu, puan hendaklah mengemukakan semula permohonan ini terus kepada Timbalan Dekan Penyelidikan di FST. Sekian untuk makluman dan tindakan pihak puan seterusnya.

Terima kasih.

Yang menjalankan tugas

(ZUL-ATFI BIN HASHIM)

Pegawai tadbir
Sekretariat Penyelidikan

s.k. -  Timbalan Dekan Penyelidikan, FST

- Fail



KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA [KUSTEM]

Mengabang Telipot
21030 Kuala Terengganu

*Jabatan Sains Komputer
Fakulti Sains dan Teknologi*

Tarikh: 22 Mac 2003

Sekretariat Penyelidikan KUSTEM
Institut Oseanografi
KUSTEM
(up: Prof. Dr. Faizah Shahrarom)

Puan

**MEMOHON KELULUSAN UNTUK PINDAH PERUNTUKAN (VIREMENT) DARI
BAHAN DAN BEKALAN (KOD ²³⁶⁰~~15000~~) UNTUK VOTE PERUNTUKAN 54072 KE
BELANJAWAN PERJALANAN (KOD 2100)**

Sukacita saya merujuk perkara di atas.

2. Untuk pengetahuan pihak puan, buat masa sekarang peruntukan sebanyak RM 3,600 untuk perjalanan bagi vote 54072 (Penyelidikan Jangka Pendek) adalah tidak mencukupi untuk menampung perbelanjaan perjalanan. Oleh itu saya memohon untuk memindahkan sebanyak RM 1000 dari peruntukan bahan dan bekalan yang berjumlah RM3900 ke perjalanan.
3. Segala kerjasama dari pihak puan didahului dengan ucapan ribuan terima kasih.

Sekian.

Yang benar

(NOOR AZLIZA CHE MAT)



s.k Timbalan Dekan Penyelidikan FST
Fail

Rujukan kami : KUSTEM/INOS/2-2/2/3 Jld.3 (4)

Tarikh : 26hb. Mac 2003

Prof. Madya Dr. Norhayati Mohd. Tahir
Jabatan Sains Kimia
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia

Assalamualaikum Warahmatullahi Wabarakatuh | Salam Sejahtera.

Puan,

PERMOHONAN KELULUSAN UNTUK PINDAHAN PERUNTUKAN (VIREMENT) DARI PERJALANAN (2100) KE BAHAN DAN BEKALAN (2700) UNTUK PERUNTUKAN 54042

Dengan segala hormatnya saya merujuk kepada perkara di atas dan surat puan bertarikh **24 Februari 2003** adalah berkaitan.

2. Adalah dimaklumkan permohonan puan telah dibawa ke Mesyuarat Jawatankuasa Penyelidikan KUSTEM kali ke-10 yang diadakan pada 13hb. Mac 2003 yang lalu dan mesyuarat bersetuju untuk meluluskan permohonan puan dengan jumlah seperti yang dipohon.

3. Mesyuarat juga telah memutuskan bahawa sebarang permohonan untuk pindahan peruntukan jangka pendek hendaklah dihantar terus ke Timbalan Dekan Penyelidikan di fakulti masing-masing. Surat berkenaan penyerahan kuasa meluluskan pindahan peruntukan jangka pendek kepada Timbalan Dekan Penyelidikan di fakulti masing-masing ini telahpun diedarkan. (Sila rujuk surat kami bil. KUSTEM/INOS/2-2/2/3 Jld.2 (64) bertarikh 17hb. Mac 2003).

4. Sekian untuk makluman dan tindakan pihak puan seterusnya.

Terima kasih.

Yang menjalankan tugas,


(ZUL-ATFI BIN HASHIM)

Pegawai tadbir
Sekretariat Penyelidikan

s.k.  Timbalan Dekan Penyelidikan, FST
En. Mohd. Isan Salleh, FST
Bendahari (u.p. : Cik Salwati binti Mohamad @ Asmara)



OLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

Mengabang Telipot, 21030 Kuala Terengganu

Institut Oseanografi

Rujukan kami : KUSTEM/INOS/2-2/2/3 Jld.3 (3)

Tarikh : 25hb. Mac 2003

En. Suhaimi Suratman
Jabatan Sains Kimia
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia

Assalamualaikum Warahmatullahi Wabarakatuh / Salam Sejahtera.

Tuan,

PERMOHONAN KELULUSAN UNTUK PINDAHAN PERUNTUKAN (VIREMENT) DARI PERJALANAN (2100) KE BAHAN DAN BEKALAN (2700) UNTUK PERUNTUKAN 54046

Dengan segala hormatnya saya merujuk kepada perkara di atas dan surat tuan bil. bertarikh **19 Mac 2003** adalah berkaitan.

2. Adalah dimaklumkan Mesyuarat Jawatankuasa Penyelidikan KUSTEM kali ke-10 yang diadakan pada 13hb. Mac 2003 yang lalu telah memutuskan bahawa sebarang permohonan untuk pindahan peruntukan jangka pendek hendaklah dihantar terus ke Timbalan Dekan Penyelidikan di fakulti masing-masing. Surat berkenaan penyerahan kuasa meluluskan pindahan jangka pendek kepada Timbalan Dekan Penyelidikan di fakulti masing-masing ini telahpun diedarkan. (Sila rujuk surat kami bil. KUSTEM/INOS/2-2/2/3 Jld.2 (64) bertarikh 17hb. Mac 2003).

3. Sehubungan itu, tuan hendaklah mengemukakan semula permohonan ini terus kepada Timbalan Dekan Penyelidikan di FST. Sekian untuk makluman dan tindakan pihak puan seterusnya.

Terima kasih.

Yang menjalankan tugas,

(ZUL-ATFI BIN HASHIM)

Pegawai tadbir
Sekretariat Penyelidikan

s.k.  Timbalan Dekan Penyelidikan, FST

- Fail



KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA IKUSTEMI

Mengabang Telipot
21030 Kuala Terengganu

Jabatan Sains Kimia
Fakulti Sains dan Teknologi

Tarikh: 19 Mac 2003

Sekretariat Penyelidikan KUSTEM
Institut Oseanografi
KUSTEM
(up: Prof. Dr. Faizah Shaharom)

Puan

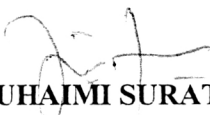
**MEMOHON KELULUSAN UNTUK PINDAH PERUNTUKAN (VIREMENT) DARI
BELANJAWAN PERJALANAN (KOD 2100) KE BAHAN DAN BEKALAN (KOD
~~15000~~) UNTUK VOTE PERUNTUKAN 54046
2700**

Sukacita saya merujuk perkara di atas.

2. Untuk pengetahuan pihak puan, buat masa sekarang peruntukan sebanyak RM21,000 untuk bahan dan bekalan bagi vote 54046 (Penyelidikan Jangka Pendek) adalah tidak mencukupi sedangkan terdapat banyak bahan-bahan kimia yang sudah kehabisan dan perlu dibeli semula. Oleh itu saya memohon untuk memindahkan sebanyak RM700 dari peruntukan perjalanan yang berjumlah RM4,000 ke bahan dan bekalan.
3. Segala kerjasama dari pihak puan didahului dengan ucapan ribuan terima kasih.

Sekian.

Yang benar


(SUHAIMI SURATMAN)



s.k Timbalan Dekan Penyelidikan FST
Fail

Rujukan Kami : KUSTEM/FST/D/2-2/1

Tarikh : 29 Januari 2003

Prof. Dr. Mohd Lokman Husain
Pengarah
Institut Oseanografi
Kolej Universiti Sains dan Teknologi Malaysia
Mengabang Telipot
21030 KUALA TERENGGANU.

Assalamualaikum wrt. wbt.

Y. Bhg. Prof.,

PERMOHONAN PERUNTUKAN PENYELIDIKAN JANGKA PENDEK
- Encik Razak bin Zakariya

Dengan segala hormatnya menarik perhatian tuan kepada perkara di atas.

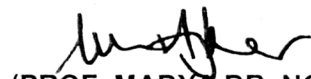
Sukacita bersama-sama ini dimajukan permohonan peruntukan penyelidikan jangka pendek En. Razak bin Zakariya yang sedang mengikuti pengajiannya di United Kingdom. Beliau amat memerlukan peruntukan ini bagi menjalankan tugas-tugas penyelidikannya.

Di atas pertimbangan dan perhatian Y. Bhg. Prof. di dalam perkara ini didahului dengan ribuan terima kasih.

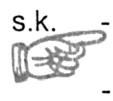
Sekian, untuk tindakan Y. Bhg. Prof. selanjutnya.

" BERKHIDMAT UNTUK NEGARA "

Saya yang menjalankan tugas,



(PROF. MADYA DR. NOOR AZHAR MOHAMED SHAZILI)
Dekan

s.k. - Timbalan Dekan (Penyelidikan dan Siswazah)
 - Fail Edaran

Rujukan kami : KUSTEM/INOS/2-2/1 Jld. 3 (59)
Tarikh : 26hb. Januari 2003



Dekan
Fakulti Sains dan Teknologi
Dekan
Fakulti Pengurusan dan Ekonomi
Dekan
Fakulti Agroteknologi dan Sains Makanan
Dekan
Pusat Pengajian Siswazah
Kolej Universiti Sains dan Teknologi Malaysia

Assalamualaikum Warahmatullahi Wabarakatuh / Salam Sejahtera.

Y. Bhg. Prof./Dr./Tuan/Puan,

**PERBINCANGAN PENYELIDIKAN BERSAMA PUSAT PENGURUSAN PENYELIDIKAN,
UNIVERSITI PUTRA MALAYSIA**

Dengan segala hormatnya saya merujuk kepada perkara di atas.

2. Sukacita dimaklumkan bahawa satu perbincangan penyelidikan akan diadakan di antara semua 'contact person' bagi setiap bidang penyelidikan utama di KUSTEM dengan Pusat Pengurusan Penyelidikan (RMC) UPM, Serdang. Berikut adalah butiran mengenai perbincangan ini :

Tarikh : 04hb. Februari 2003
Masa : 2.30 petang
Tempat : Bilik Mesyuarat INOS

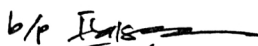


3. Antara agenda yang akan dibincangkan dalam perbincangan ini adalah :

- i) Kata-kata Aluan
- ii) Penyelidikan Bersama
- iii) Mengenalpasti projek-projek penyelidikan yang akan dijalankan

4. Sehubungan itu, kami mengalu-alukan kedatangan Y. Bhg. Prof./Dr./Tuan/Puan untuk bersama-sama dalam perbincangan ini. Untuk makluman Y. Bhg. Prof./Dr./Tuan/Puan, perbincangan ini akan dipengerusikan oleh Y. Bhg. Dato' Rektor. Senarai 'contact person' yang terlibat adalah seperti lampiran. Segala kerjasama daripada Y. Bhg. Prof./Dr./Tuan/Puan kami akhiri dengan ucapan ribuan terima kasih. Sekian.

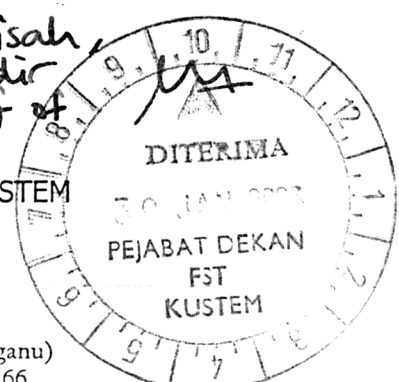
Yang menjalankan tugas,

b/p 

(PROF. DR. FAIZAH BINTI SHAHAROM)

Timbalan Pengarah INOS/Penyelaras Sekretariat Penyelidikan KUSTEM

→ Dr Nakisah
Sila hadir
on behalf of
FST



**SENARAI 'CONTACT PERSON' DAN BIDANG KEUTAMAAN PENYELIDIKAN DI
KUSTEM**

BIL	NAMA	BIDANG KEUTAMAAN
1	DR. AZIZ BIN AHMAD	MARINE BIO-TECHNOLOGY
2	PROF. MADYA DR. NIK FUAD BIN NIK MOHD. KAMIL	ECOLOGICAL ECONOMIC
3	PROF. MADYA SULONG BIN IBRAHIM	MANGROVE
4	PROF. DR. CHAN ENG HENG	SEA TURTLE RESEARCH AND CONSERVATION
5	PROF. DR. LAW AH THEEM	OCEANOGRAPHY AN ENVIRONMENTAL POLLUTION
6	PROF. DATO' DR. SULAIMAN BIN MD. YASSIN	ISLAND AND PERIPHERAL COMMUNITIES
7	PROF. DR. ABU OSMAN BIN MOHD TAP	INFORMATIC AND MATHEMATICAL MODELLING
8	PROF. DR. FAIZAH BINTI SHAHAROM	FISH HEALTH AND MANAGEMENT
9	EN. MOHD. ZAIDI ZAKARIA	BIODIVERSITY AND MANAGEMENT
10	EN. MOHD. ZAMRI IBRAHIM	RENEWABLE ENERGY
11	PROF. MADYA DR. SAHARUDDIN BIN DATO' ABD. HAMID	SUSTAINABILITY SCIENCE
12	DR. MOHAMED KAMIL BIN ABDUL RASHID	WATER RESOURCES
13	DR. KAMARUZZAMAN BIN YUNUS	SOUTHERN OCEANS AND ANTARCTICA
14	DR. ABOL MUNAFI BIN AMBOK BOLONG	AQUACULTURE

Rujukan kami : KUSTEM/INOS/2-2/1 Jld. 3 (57)

Tarikh : 26hb. Januari 2003

Prof. Dato' Dr. Sulaiman bin Md Yassin
Prof. Dr. Mohd. Azmi bin Ambak
Prof. Dr. Mohd Lokman bin Husain
Prof. Madya Ir Ahmad bin Jusoh
Prof. Dr. Hamdan bin Suhaimi
Prof. Madya Dr. Yazid bin Mohd. Saman
Prof. Dr. Law Ah Theem
Dr. Anuar Hasan
Dr. Amiza binti Mat Amin
Dr. Kamaruzzaman bin Yunus
Dr. Khalid Samo
Prof. Madya Dr. Wan Salihin Wong Abdullah
Prof. Madya Dr. Nik Fuad Nik Mohd Kamil
Dr. Mahadzirah Mohamad
Dr. Fauziah binti Abu Hassan
Prof. Madya Dr. Saharuddin bin Dato' Abd. Hamid
Prof. Madya Dr. Sayed Zain S. Hassan
Prof. Madya Dr. Nakisah Mat Amin
Prof. Dr. Ismail Mohd
Prof. Madya Dr. Ku Halim Ku Bulat
Prof. Dr. Abu Osman bin Md. Tap
Prof. Madya Dr. Mustafa Mat Deris
Dr. Muhammad Suzuri bin Hitam
Prof. Madya Dr. Noor Azhar Mohd. Shazili
Prof. Madya Dr. Norhayati Mohd. Tahir
En. Mohd. Pouzi bin Hamzah
En. Mohd. Sarif Abd. Manaf
Semua Pensyarah/Penyelidik
Kolej Universiti Sains dan Teknologi Malaysia

Assalamualaikum Warahmatullahi Wabarakatuh | Salam Sejahtera.

Y. Bhg. Dato'/Prof./Tuan/Puan

TAKLIMAT PENILAIAN PERMOHONAN PENYELIDIKAN IRPA/JANGKA PENDEK

Dengan segala hormatnya saya merujuk kepada perkara di atas.

2. Adalah dimaklumkan bahawa Sekretariat Penyelidikan KUSTEM akan menganjurkan satu program Taklimat Penilaian Permohonan Penyelidikan IRPA/Jangka Pendek kepada semua panel penilai dan penilai tambahan bagi setiap bidang kepakaran dan pengkhususan. Taklimat ini bertujuan memberikan pendedahan dan garis panduan sebenar dalam menilai setiap permohonan sama ada IRPA ataupun Jangka Pendek. Butiran taklimat adalah sepertimana berikut :

Tarikh : **05hb. Februari 2003 (Rabu)**
Tempat : **Dewan Syed Jalaluddin (DSJ)**
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia

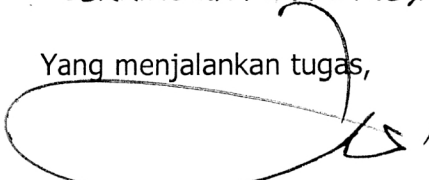
3. Untuk makluman Y. Bhg. Dato'/Prof./Tuan/Puan juga taklimat ini akan disampaikan oleh Prof. Madya Dr. Mohd. Shahwahid bin Hj. Othman (Timb. Pengarah Policy Planning & Finance Unit) dan Prof. Dr. Fatimah binti Md. Yusoff (Timb. Pengarah Research Grant Unit). Kedua-dua penceramah ini adalah dari Research Management Centre (RMC) Universiti Putra Malaysia (UPM), Serdang. Bersama ini dilampirkan tentatif program bagi taklimat ini.

4. Taklimat ini juga terbuka kepada mana-mana pensyarah atau penyelidik yang berminat. Semoga mendapat perhatian dan kerjasama sepenuhnya daripada Y. Bhg. Dato'/Prof./Tuan/Puan. Sila lengkapkan borang maklum balas pengesahan kehadiran yang dilampirkan dan dikembalikan semula ke Sekretariat Penyelidikan, KUSTEM **sebelum atau pada 02hb. Februari 2003.** Surat ini juga akan di'attach'kan dalam email Y. Bhg. Dato'/Prof./Tuan/Puan. Maklumbalas juga boleh dihantar menggunakan email ke alamat azza@kustem.edu.my. Sekian untuk makluman dan tindakan Y. Bhg. Dato'/Prof./Tuan/Puan seterusnya.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Yang menjalankan tugas,


(ZUL-ATFI BIN HASHIM)

Pegawai Tadbir

Sekretariat Penyelidikan

B/pTimbalan pengarah INOS/ Penyelaras Sekretariat Penyelidikan KUSTEM

s.k

-	Y. Bhg. Dato' Rektor	}	<i>Pohon kerjasama tuan/puan untuk mengedarkan borang maklumbalas ini kepada semua pensyarah di fakulti masing-masing. Terima kasih.</i>
-	Cik Suzie @ Nadia binti Jusoh		
-	En. Mohd Isan Salleh		
-	Fail		

TENTATIF PROGRAM

Seminar	:	Taklimat Penilaian Permohonan Penyelidikan (IRPA dan Jangka Pendek)
Tarikh	:	05hb. Februari 2003 (Rabu)
Tempat	:	Dewan Syed Jalaluddin, Fakulti Sains dan Teknologi Kolej Universiti Sains dan Teknologi Malaysia (KUSTEM) Mengabang Telipot 21030 Kuala Terengganu
Anjuran	:	Sekretariat Penyelidikan, KUSTEM
Penceramah	:	i) Prof. Madya Dr. Mohd. Shahwahid Hj. Othman - Timbalan Pengarah Policy Planning & Finance Unit ii) Prof. Dr. Fatimah Md. Yusoff - Timbalan Pengarah Research Grant Unit
Seminar Highlights	:	Prosedur Menilai Permohonan IRPA/ Jangka Pendek
Seminar Hour	:	9.00 pagi – 12.00 tengahari
Kumpulan Sasaran	:	Semua Penilai IRPA/Jangka Pendek KUSTEM

**ITENARY OF WORKING VISIT OF RESEARCH MANAGEMENT CENTRE (RMC)
UNIVERSITI PUTRA MALAYSIA TO KUSTEM (4-5 FEBRUARY 2003)**

DATE	TIME	PROGRAMME	PERSON IN CHARGE
4 th Feb 2003	8.15 am	Arrival at Kuala Terengganu Airport	En. Subarjo Merehojono
	8.30 am	Check-in at Primula Park Royal, Batu Burok , Kuala Terengganu	En. Subarjo Merehojono
	2.00 pm	Travel to KUSTEM	En. Subarjo Merehojono
	2.15 pm	Courtesy call to Rector's KUSTEM	Prof. Dr. Faizah Shaharom
	2.30 pm	Meeting with top administrators of KUSTEM	En. Zul-Atfi Hashim
	3.30 pm	Tour of KUSTEM labs	Pn. Shaharul Suhaila Ismail & En. Mohd. Zulkamal Radzi
	8.00 pm	Dinner	Prof. Dr. Faizah Shaharom
5 th Feb. 2003	9.00 am	Welcome by Director of Institute of Oceanography	
	9.15 am	Remarks by Director, RMC, UPM, Prof. Dr. Zulkifli	
	9.30 am	General Procedures and Practices for Evaluation of Projects at KUSTEM by Prof. Dr. Fatimah binti Md. Yusoff	
	10.30 am	Morning tea-break	Cik Faezah Salleh
	11.00 am	Break-up into groups Prof. Dr. Zulkifli and Prof. Dr. Fatimah lead science group, Assc. Prof. Dr. Mohd. Shahwahid lead social science group	
	1.00 pm	Lunch at Chillada Restaurant	
	5.00 pm	Flight to Airport	



Rujukan kami : KUSTEM/INOS/2-2/2/3 Jld. 2 (48)

Tarikh : 17hb. Februari 2003

En. Razak Zakariya
Jabatan Perikanan dan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia

Assalamualaikum Warahmatullahi Wabarakatuh

Tuan,

PERMOHONAN PERUNTUKAN PENYELIDIKAN JANGKA PENDEK 2003 – Tajuk Projek : Land Activities Effect On Estuary And Coastal Water Region By Remote Sensing And GIS Application (Emphasis On Suspended Sediment)

Dengan segala hormatnya saya merujuk kepada perkara di atas.

2. Adalah dimaklumkan bahawa Sekretariat Penyelidikan tidak dapat meluluskan permohonan peruntukan penyelidikan Jangka Pendek 2003 yang dipohon oleh tuan bertajuk ***Land Activities Effect On Estuary And Coastal Water Region By Remote Sensing And GIS Application (Emphasis On Suspended Sediment)***.

3. Ini adalah kerana tuan masih memegang jawatan tutor dan masih dalam cuti belajar di luar negara, sedangkan penyampelan dilakukan di Kuantan, Pahang. Sehubungan itu, sekiranya terdapat sebarang masalah yang timbul dalam projek ini nanti akan menyukarkan pihak kami untuk menghubungi tuan yang masih dalam cuti belajar.

4. Semoga mendapat perhatian dan kerjasama sepenuhnya dari pihak tuan dalam perkara ini. Segala kerjasama yang diberikan kami dahului dengan ucapan ribuan terima kasih. *Sekian.*

"BERKHIDMAT UNTUK NEGARA"

Yang menjalankan tugas,

(ZUL-ATFI BIN HASHIM)

Pegawai Tadbir
Sekretariat Penyelidikan KUSTEM

s.k - Timbalan Dekan Penyelidikan, FST

Fail

MEMORANDA PERHUBUNGAN

TARIKH : 27 JANUARI 2003

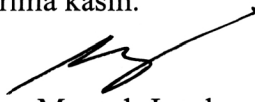
KEPADA : SEKRETARIAT PENYELIDIKAN
KUSTEM
D/A INSTITUT OSEANOGRAFI

DARIPADA : TIMBALAN DEKAN (PPS), FST

LAPORAN KEMAJUAN PENYELIDIKAN JANGKA PENDEK

Bersama-sama ini disertakan laporan bagi penyelidik-penyelidik seperti berlampir :

Terima kasih.


Puan Maznah Jusoh
b/p Timbalan Dekan (PPS)

lampiran ...

s.k. Mohd. Isan Salleh
FST

C:laporan kemajuan
NMA/mj.

Bil.	Nama	Tajuk Projek	Status
1.	Muhamad Safiih Lola	The Performance of Bootstrap Confidence Intervals of Correlation Coefficient based On M-estimator	
2.	Sumazly Sulaiman	Building an ideal University model for mobile information services using WAP	Memuaskan
3.	Dr. Abol Munafi Ambok Bolong	Molecular Genetic of Snakehead in Malaysia	Memuaskan
4.	Dr. Abol Munafi Ambok Bolong	Kajian Keupayaan Pembiakan Progeni Keli Kacukan, Warisan Genetik dan Daya Ketahanan Penyakit	Memuaskan

Panduan Penyerahan Laporan Kemajuan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM.

1. TAJUK: The Performance of Bootstrap Confidence Intervals of Correlation Coefficient based on M-estimator

2. Ketua Penyelidik: MUHAMAD SAFIHH LOLA

No. Kad Pengenalan: 720214-12-5163

**3. Ahli Penyelidik: 1)
2)
3)**

Objektif/Matlamat Projek:

- Compare the coverage probability of bootstrap 95% Bca confidence intervals for a correlation coefficient estimated using traditional estimators and robust estimators.
- Compare the coverage probability of bootstrap 95% Bca confidence intervals for a correlation coefficient from two non-normal distribution process, estimated using traditional estimators and robust estimators. The two underlying process distributions that will be study are the Student-t distribution and Chi-Square distribution.
- Compare the coverage probability of bootstrap 95% Bca confidence intervals for a correlation coefficient with and without contamination, estimated using traditional estimators and robust estimators

4. Pencapaian (seperti penemuan baru, penerbitan, pembentangan kertas kerja)

Masih ditahap pengujian dan pembuktiaan.

5. Perancangan kerja untuk 2003:

Perancangan akan tertumpu kepada membuat pengaturcaraan (programming) bagi mendapatkan hasil yang dikehendaki seperti dalam objektif kajian. Disamping itu perancangan juga akan ditumpukan kepada usaha-usaha untuk mencari bahan-bahan berkaitan untuk kegunaan penulisan dan rujukan.

6. Kesan signifikan (seperti untuk komuniti penyelidikan, industri, ijazah lanjutan)

Berguna dalam sektor industri terutamanya industri yang berorientasikan pembuatan

7. Isu dan masalah yang dihadapi:

Perkara pokok yang menjadi masalah ialah membuat dan membuktikan pengaturcaraan (programming) agar hasil yang diperolehi bersesuaian dengan objektif kajian.

Laporan Kemajuan Penyelidikan Jangka Pendek

Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh 1hb April 2002 **Ke** 1hb April 2003

BAHAGIAN 1: MAKLUMAT PROJEK

TAJUK: Building An Ideal University Model for Mobile Information Services Using WAP

KOD: 54049

JENIS: Baru

Ketua Penyelidik: Sumazly Sulaiman

ID Pegawai: A1867

1. Objektif: To develop an ideal model for mobile internet content using WAP platform for university environment

2. Pelaksanaan Projek

a). Kegiatan Projek:

- Studies, references and work requirements - completed
- Testing of new software and sdk toolkit – completed
- Establish design and interfaces – completed
- System development – completed
- Beta test- in progress
- System check and stability-in progress
- Final delivery and acceptance – not started yet
- Commencing on line – not started yet

b). Kemajuan projek secara keseluruhan:

- Current progress = 70 % completed
- Have published 3 conference papers; Egypt, Kuantan and KL
- current work –debugging beta test

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

none – work progressing well

d). Program kerja masa hadapan:

- system fine tuning until end Feb 2003

BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Upah kerja (2900)	3000	3000.00	0.00
Perjalanan (2100)	5000	7280.18	-2280.18
Bekalan dan Bahan (2700)	6000	3458.75	2541.25
Jumlah Besar	14000	13738.93	261.07

BAHAGIAN III: MAKLUMAT PENYELIDIK

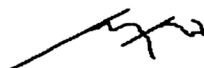
Fakulti / Pusat / Bahagian: Fakulti Sains dan Teknologi

Jabatan: Jabatan Sains Komputer

Ketua Penyelidik: Sumazly Sulaiman

Penyelidik Bersama: -tiada-

Tandatangan Ketua Penyelidik:



Tarikh: 25/Januari/2003

Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh 30hb Ogos 2002 Ke 1hb April 2003

**BAHAGIAN 1: MAKLUMAT
PROJEK**

TAJUK: Molecular Genetic Of Snakehead In Malaysia

KOD: 54038

JENIS: Siswazah

Ketua Penyelidik: Dr. Abol Munafi Ambok Bolong

ID Pegawai:

1. Objektif:

- To establish protocol to analyze snakeheads using RAPD technique.
- To detect genetic variation among snakehead species in Malaysia including *C. bankanensis*, *C. maruloides*, *C. melasoma*, *C. lucius*, *C. gachua*, *C. micropeltes*, *C. striatus*.
- To detect genetic populations of snakehead (*C. striatus*) in Eastern (Terengganu), Western North (Perlis), Center (Perak) and South (Johor) of Peninsular Malaysia.

2. Perlaksanaan Projek

a). Kegiatan Projek:

Genitic variation of snakehead species (*Channa bankanensis*, *C. maruloides*, *C. melasoma*, *C. lucius*, *C. gachua*, *C. micropeltes*, and *C. striatus* and populations from Terengganu, Perlis, Perak and Johore have just finished analysis using Random Amplified Polymorphism method.

b). Kemajuan projek secara keseluruhan:

- Polymerase Chain Reaction has been conducted for six species and four populations.

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

- Chemical delay

d). Program kerja masa hadapan:

- Genetic population fish specimens from each location (Terengganu, Perlis, Perak and Johor) will be amplified using RAPD technique.
- Data will be computed to find out genetic variation among snakehead species.

BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	-	-	-
Perjalanan (2100)	3,000	56.78	2943.22
Bekalan dan Bahan (2700)	15,000	16,681	0
Jumlah Besar	18,000	16,737.78	2943.22

BAHAGIAN III: MAKLUMAT PENYELIDIK

Fakulti / Pusat / Bahagian: Fakulti Agroteknologi dan Sains Makanan

Jabatan: Jabatan Sains Perikanan dan Akuakultur

Ketua Penyelidik: Dr. Abol Munafi Ambok Bolong

Penyelidik Bersama: Prof.Dr. Mohd. Azmi Bin Ambak

Tandatangan Ketua Penyelidik:

DR. ABOL MUNAFI AMBOK BOLONG
Penyelidik

Tarikh: 26/1/03

Jabatan Perikanan dan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Mengabang Telipok
Kuala Terengganu

Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh 1 April 2002 Ke 1 April 2003

BAHAGIAN 1: MAKLUMAT PROJEK

TAJUK: Kajian Keupayaan Pembiakan Progeni Keli Kacukan, Warisan Genetik dan Daya Ketahanan Penyakit.

KOD: 54068

JENIS: Baru

Ketua Penyelidik: Dr. Abol Munafi Ambok Bolong

ID Pegawai:

1. Objektif:

- Mengkaji keupayaan pembiakan progeni kacukan dan penghasilan progeni F2
- Mengkaji perhubungan atau perwarisan genetik antara progeni kacukan dengan spesies induk
- Mengkaji daya ketahanan progeni kacukan terhadap penyakit berbanding spesies induk

2. Perlaksanaan Projek

a). Kegiatan Projek:

- Tindakan sedang dijalankan untuk mempertingkatkan mutu induk dengan pengawalan pemberian makanan dan penjagaan mutu air bagi memastikan kegagalan pembenihan kesan dari mutu induk induk yang rendah dapat dielakkan.
- Pengumpulan induk tempatan liar masih diteruskan bagi menambah stok sedia ada.
- Pendederan benih-benih yang diperolehi dari aktiviti-aktiviti pembiakan dijalankan untuk mendapatkan benih pada saiz yang sesuai untuk kajian seterusnya.

b). Kemajuan projek secara keseluruhan:

- Penghasilan benih F1 telah berjaya dihasilkan dan didapati kadar tumbesaran dan kemandiriannya menyamai atau lebih baik berbanding induk asal.
- Aktiviti penghasilan benih F2 telah dan sedang dijalankan tetapi masih tidak menunjukkan kejayaan. Ia kemungkinan besar akibat mutu induk yang kurang baik. Justeru, aktiviti penghasilan F2 masih diteruskan dengan menjalankan aktiviti pengurusan induk dengan lebih baik.

- Kacukan balik progeny F1 dengan induk parental (*Clarias gariepinus*) telah menunjukkan kejayaan. Namun, kadar penetasannya agak rendah, juga mungkin disebabkan oleh mutu induk yang kurang baik. Pendederan benih yang terhasil sedang dijalankan.
- Data-data yang diperolehi dari kajian-kajian yang telah dijalankan masih dalam proses penyelarasan dan analisis.

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

- Masalah pengumpulan induk keli tempatan yang matang.
- Masalah bekalan air semulajadi di hatchery KUSTEM semakin kritikal dengan penutupan kolam takungan air bagi memberi laluan kepada pembangunan infrastuktur. Buat masa ini bekalan air bergantung sepenuhnya kepada air paip. Didapati ia mendatangkan kesan yang kurang baik, khasnya kepada mutu induk.

d). Program kerja masa hadapan:

- Penghasilan benih F2 akan diteruskan lagi dengan usaha -usaha bagi mempertingkatkan mutu induk.
- Penilaian tentang keupayaan pembiakan progeny kacukan akan dibuat dan bincangkan berdasarkan data-data yang telah dikumpul.
- Kajian terhadap daya ketahanan penyakit progeny F1 dan F2 akan dijalankan. Bagaimanapun, ia sangat bergantung kepada kejayaan program pembenihannya.

BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	4000	2400	1600
Perjalanan (2100)	1000	0	1000
Bekalan dan Bahan (2700)	15,000	18,782.20	0
Jumlah Besar	20,000	21,182.20	2600

MEMORANDA PERHUBUNGAN

TARIKH : 1 DISEMBER 2002

KEPADA : SEKRETARIAT PENYELIDIKAN
KUSTEM
D/A INSTITUT OSEANOGRAFI

DARIPADA : TIMBALAN DEKAN (PPS), FST

LAPORAN KEMAJUAN PENYELIDIKAN JANGKA PENDEK

Bersama-sama ini disertakan laporan bagi penyelidik-penyelidik seperti berlampir :

Terima kasih.



Puan Maznah Jusoh
b/p Timbalan Dekan (PPS)

lampiran ...

s.k. Mohd. Isan Salleh
FST

C:laporan kemajuan
NMA/mj.

Bil.	Nama	Tajuk Projek	Status
1.	Abdul Aziz K. Abdul Hamid	Implementing Temporal Risk Management in Government Electronic Information	Memuaskan
2.	Prof. Madya Dr. Norhayati Mohd. Tahir	Selected trace metals content and its mobility in soils around Terengganu	Memuaskan
3.	Prof. Madya Dr. Norhayati Mohd. Tahir	Hydrocarbons distributions in sediments found in the coastal areas of Penggerang, Johor	Memuaskan
4.	Prof. Madya Dr. Norhayati Mohd. Tahir	Study on distribution and source of polycyclic aromatic hydrocarbon in soils of Terengganu and Pahang	Memuaskan
5.	Mohd. Sarif bin Abd Manap	Faktor-faktor penghalang terhadap penggunaan Blackboard di kalangan Pensyarah UMS, UTP dan KUSTEM	Memuaskan

Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh ...1hb. April 2002 Ke ...1hb. April 2003

BAHAGIAN 1: MAKLUMAT PROJEK

TAJUK: Implementing Temporal Risk Management in Government Electronic Information

KOD: 54057

JENIS: Baru / Sambungan / Siswazah

Ketua Penyelidik: Abdul Aziz K. Abdul Hamid

ID Pegawai: 660604-11-5161

1. Objektif: To improve digital information management in public sector

2. Perlaksanaan Projek

a). Kegiatan Projek:

Literature review – 80 %
Conceptual Model Development – 70 %
Module Development – 50 %

b). Kemajuan projek secara keseluruhan:

60 – 75 %

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

Fokus ditukarkan kepada pembangunan konsep asas 'Temporal Risk Model'
Pembangunan perisian 'Temporal Risk Model' akan diterapkan ke dalam Model SDLC

d). Program kerja masa hadapan:

BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	3000	344.80	2655.20
Perjalanan (2100)	3000	741	2259
Bekalan dan Bahan (2700)	9000	8300	700
Jumlah Besar	15000	9385.80	5614.20

BAHAGIAN III: MAKLUMAT PENYELIDIK

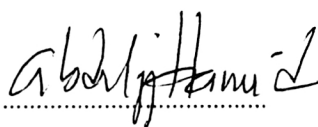
Fakulti / Pusat / Bahagian: Fakulti Sains dan Teknologi

Jabatan: Jabatan Sains Komputer

Ketua Penyelidik: Abdul Aziz K. Abdul Hamid

Penyelidik Bersama:

Tandatangan Ketua Penyelidik:



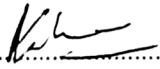
Tarikh: 25hb. November 2002

**BAHAGIAN IV: PENILAIAN JAWATANKUASA
PENYELIDIKAN FAKULTI/PUSAT/BAHAGIAN**

Jawatankuasa Fakulti / Pusat / Bahagian:

Laporan: [Memuaskan / Tidak Memuaskan]

Cadangan:

Tandatangan Pengerusi: J/K Penyelidikan Fakulti / Pusat / Bahagian 

Tarikh:

Prof. Madya Dr. Nakisah Mat Amin
Timbalan Dekan
Penyelidikan dan Siswazah
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu

Jawatankuasa Penyelidikan Universiti

Komen:

Tandatangan Pengerusi: J/K Penyelidikan Universiti

Tarikh:

Keputusan: Projek dilanjutkan / diberhentikan:

Laporan Kemajuan Penyelidikan Jangka Pendek

Panduan Penyusunan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh ...1 hb May 2002..... Ke ...31 hb April 2003...

BAHAGIAN

1: MAKLUMAT PROJEK

TAJUK: Selected trace metals content and its mobility in soils around Terengganu

KOD: 54043

JENIS: Baru / Sambungan / **Siswazah**

Ketua Penyelidik: Prof. Madya Dr. Norhayati Mohd. Tahir

ID Pegawai:

1. Objektif:

1. To determine the concentration and the distribution pattern of trace metals in soil in relationship with the soil type around Terengganu
2. To determine the mobility of trace metals in soil, which will be used to estimate the degree of pollution by trace metals
3. To acquire a set of data (metals concentration in soil) to be use as baseline concentration in Terengganu as a future reference

2. Perlaksanaan Projek

a). Kegiatan Projek:

Basically the whole project will be divided into three main part, which is

i) Soil sampling and soil sample preparation

- Soil sample air dried
- Sieving soil sample to below 2 mm
- Storage of soil sample

ii) Basic soil sample analysis

- pH
- Particle size analysis (PSA)
- Total organic carbon (TOC)

- Cation exchange capacity (CEC)
 - Total metals extraction
 - Sequential metals extraction
- iii) Data analysis and data compilation

b). Kemajuan projek secara keseluruhan:

i) Basic soil sample analysis

We have completed experiments on soil pH analysis (last progress report) and recently have completed the PSA analysis and TOC analysis on the soil samples. Basically with the completion of these three analyses and also the CEC analysis we can say that we have obtain the necessary information needed to better understand the soil sample characteristic.

We are now concentrating on the open digestion to get the total metal content in soil (total soil which is below 2 mm)

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

There is one problem that we faced, which is the insufficient of the equipment needed for the analysis of CEC. The test tube for the centrifuge machine cannot sustain 50 ml of soil sample plus solution. With this we have to find a different alternative or a different method for CEC analysis. Other than that we did not face much problem in the progress of the project.

Until now there is a reluctant on agent to quote the soil reference materials (refer to first report)

d). Program kerja masa hadapan: (for the next quarter of the year)

- i) Ordering of soil SRM and other consumables
- ii) Searching for a new method for CEC analysis and then the CEC analysis
- iii) Methods validation of totals metals extraction from soils using soil SRM
- iv) Determination of total metals content in soil will be carried out after the methods have been validated and recovery qualified.
- v) Sequential metals concentration will be carried out to determine selected metals speciation in soil.

**BAHAGIAN
PERUNTUKAN**

II:

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	-	-	RM 800
Perjalanan (2100)			RM 800
Bekalan dan Bahan (2700)	-	-	RM 23400
Jumlah Besar	-	-	RM 25000

BAHAGIAN

III:

MAKLUMAT PENYELIDIK

Fakulti / Pusat / Bahagian: Faculty of Science and Technology

Jabatan: Department of Chemistry

Ketua Penyelidik: Prof. Madya Dr. Norhayati Mohd Tahir

Penyelidik Bersama:

1. Prof Madya Dr. Noor Azhar Mohd Shazili
2. Dr. Kamaruzzaman bin Yunus
3. Hoo Eu Gene

Tandatangan Ketua Penyelidik: 

Tarikh: 25/11/08

**BAHAGIAN IV: PENILAIAN
JAWATANKUASA PENYELIDIKAN
FAKULTI/PUSAT/BAHAGIAN**

Jawatankuasa Fakulti / Pusat / Bahagian:

Laporan: [Memuaskan / Tidak Memuaskan]

Cadangan:

Tandatangan Pengerusi: J/K Penyelidikan Fakulti / Pusat / Bahagian

.....

Prof. Madya Dr. Nakisah Mat Amin
Timbulan Dekan

Penyelidikan dan Siswazah
Fakulti Sains dan Teknologi

Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)

21030 Kuala Terengganu

Tarikh:

Jawatankuasa Penyelidikan Universiti

Komen:

Tandatangan Pengerusi: J/K Penyelidikan Universiti

.....

Tarikh:

Keputusan: Projek dilanjutkan / diberhentikan:



Laporan Kemajuan Penyelidikan Jangka Pendek

Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh ...01 APRIL 2002..... Ke ...01 APRIL 2003

BAHAGIAN 1: MAKLUMAT PROJEK

TAJUK: Faktor-Faktor Penghalang Terhadap Penggunaan Blackboard Di Kalangan Pensyarah
Universiti Malaysia Sabah, Universiti Teknologi Petronas dan KUSTEM

KOD: 54051

JENIS: Baru / Sambungan / Siswazah

Ketua Penyelidik: MOHD SARIF BIN ABD MANAP

ID Pegawai: A1680

1. Objektif:

1. Mengenalpasti factor-faktor kekangan terhadap penggunaan Blackboard di kalangan pensyarah di Universiti Malaysia Sabah, Universiti Teknologi Petronas dan KUSTEM. Di antara factor-faktor halangan yang akan di kaji ialah:
 - a. Kemanusiaan
 - b. Birokrasi
 - c. Faktor teknologi
 - d. Pengetahuan dalam Pengajaran dan Pembelajaran
 - e. Logistik
2. Melihat peranan Fakulti-fakulti dan Pusat Penjaminan Kualiti KUSTEM terhadap penggunaan Blackboard di kalangan pensyarah.
3. Meninjau kadar penggunaan Blackboard khususnya dalam konteks pengajaran dan pembelajaran di kalangan pensyarah.
4. Membuat rumusan dan cadangan kepada pihak-pihak yang bertanggungjawab dengan hasrat meningkatkan peranan teknologi pengajaran dan pembelajaran dalam menghasilkan pendidikan yang lebih efektif
5. Menganalisis pendekatan penggunaan Blackboard yang effisen.

2. Pelaksanaan Projek

a). Kegiatan Projek:

1. Penyediaan soalan soal selidik
2. Perbincangan dengan pegawai berkenaan di UMS dan UTP
3. Pembelian software SPSS
4. Lawatan ke UTP dan UMS untuk meninjau pelaksanaan Blackboard di UMS dan UTP (pertengahan Julai 2002).

5. Telah melaksana kajian rintis dan didapati crombach alfa 0.78 Melaksana proses temubual dan diberi soal selidik

b). Kemajuan projek secara keseluruhan:

1. Soalan soal selidik sudah siap – **(telah jalankan pilot test dalam bulan september)**
2. Pelawaan kerjasama antara UTP dan UMS sudah diterima
3. **Pembelian software SPSS, sudah dilakukan.**
4. Lawatan ke UTP dan UMS pada 14 – 17 Julai 2002.
5. Lawatan ke UMS pada 18 – 20 Julai 2002
6. **Edaran soal selidik sebenar akan dilakukan pada Januari atau Februari 2003**
7. **Kemajuan melebihi 60 %.**

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

1. Perubahan tempat kajian daripada Universiti Malaya (UM) ke UMS dan UTP
2. Harga software SPSS telah naik kepada 3590.00 (perlu dapat kebenaran untuk perpindahan (virement) peruntukan

d). Program kerja masa hadapan:

1. Perjalanan program akan berjalan lancar sekembalinya daripada UTP dan UMS
2. **Menganalisis soalan soal selidik akan dijalankan pada Februari dan Mac 2003**
3. **Laporan dijangka siap sebelum April 2003**

BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	3000.00		
Perjalanan (2100)	6128.00		
Bekalan dan Bahan (2700)	3272.00		
Jumlah Besar	12400.00		RM2720.77

Catatan: Baki setelah dilakukan perbelanjaan adalah seperti di atas.

BAHAGIAN III: MAKLUMAT PENYELIDIK

Fakulti / Pusat / Bahagian: FAKULTI SAINS DAN TEKNOLOGI

Jabatan: JABATAN SAINS KOMPUTER

Ketua Penyelidik: mohd sarif bin abd manap

Penyelidik Bersama:

Tandatangan Ketua Penyelidik:

MOHD SHARIF ABD MANAP

Pensyarah

Jabatan Sains Komputer

Fakulti Sains dan Teknologi

Kolej Universiti Sains & Teknologi Malaysia

(KUSTEM)

21030 Kuala Terengganu.

Tarikh: ...02 Julai 2002.

**BAHAGIAN IV: PENILAIAN JAWATANKUASA
PENYELIDIKAN FAKULTI/PUSAT/BAHAGIAN**

Jawatankuasa Fakulti / Pusat / Bahagian:

Laporan: [Memuaskan / ~~Tidak Memuaskan~~]

Cadangan:

Tandatangan Pengerusi: J/K Penyelidikan Fakulti / Pusat / Bahagian  **Prof. Madya Dr. Hashish Mat Amin**

Timbalan Dean
Penyelidikan dan Inovasi
Fakulti Sains dan Teknologi

Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu

Tarikh:

Jawatankuasa Penyelidikan Universiti

Komen:

Tandatangan Pengerusi: J/K Penyelidikan Universiti

Tarikh:

Keputusan: Projek dilanjutkan / diberhentikan:

Laporan Kemajuan Penyelidikan Jangka Pendek

Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh 1 April 2002 Ke 1 April 2003

BAHAGIAN 1: MAKLUMAT PROJEK

TAJUK: Kajian Keupayaan Pembiakan Progeni Keli Kacukan, Warisan Genetik dan Daya Ketahanan Penyakit.

KOD: 54068

JENIS: Baru

Ketua Penyelidik: Dr. Abol Munafi Ambok Bolong

ID Pegawai:

1. Objektif:

- Mengkaji keupayaan pembiakan progeni kacukan dan penghasilan progeni F2
- Mengkaji perhubungan atau perwarisan genetik antara progeni kacukan dengan spesies induk
- Mengkaji daya ketahanan progeni kacukan terhadap penyakit berbanding spesies induk

2. Pelaksanaan Projek

a). Kegiatan Projek:

- Pengumpulan induk masih dijalankan.
- Penyampelan benih F2 masih dijalankan.

b). Kemajuan projek secara keseluruhan:

- Penghasilan benih F1 telah berjaya dihasilkan.
- Penghasilan benih F2 telah dijalankan tetapi tidak berjaya. Penghasilan benih F2 akan diteruskan.

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

- Masalah pengumpulan induk keli tempatan yang matang.
- Penghasilan benih F2 tidak dapat dijalankan kerana induk keli tempatan tidak mencukupi.

d). Program kerja masa hadapan:

- Penghasilan benih F2 akan diteruskan lagi.

BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	4000	2400	1600
Perjalanan (2100)	1000	0	1000
Bekalan dan Bahan (2700)	15,000	18,782.20	0
Jumlah Besar	20,000	21,182.20	2600

BAHAGIAN III: MAKLUMAT PENYELIDIK

Fakulti / Pusat / Bahagian: Fakulti Sains dan Teknologi

Jabatan: Jabatan Perikanan dan Sains Samudera

Ketua Penyelidik: Dr. Abol Munafi Ambok Bolong

Penyelidik Bersama: Prof. Dr. Faizah Shahrarom

Tandatangan Ketua Penyelidik:

DR. ABOL MUNAFI AMBOK BOLONG
Pensyarah

Tarikh: 24/10/02

Jabatan Perikanan dan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Mengabang Telipoi
Kuala Terengganu.

**BAHAGIAN IV: PENILAIAN JAWATANKUASA
PENYELIDIKAN FAKULTI/PUSAT/BAHAGIAN**

Jawatankuasa Fakulti / Pusat / Bahagian :

Laporan: [Memuaskan / Tidak Memuaskan]

Cadangan:

ok.

Tandatangan Pengerusi : J/K Penyelidikan Fakulti / Pusat / Bahagian

Prof. Madya Dr. Nakisah binti Mat Amin
Timbalan Dekan (Penyelidikan dan Siswazah)
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Tarikh:

Jawatankuasa Penyelidikan Universiti

Komen:

Tandatangan Pengerusi : J/K Penyelidikan Universiti

Tarikh:

Keputusan: Projek dilanjutkan / diberhentikan:

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Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh 30hb Ogos 2002 Ke 1hb April 2003

**BAHAGIAN 1: MAKLUMAT
PROJEK**

TAJUK: Molecular Genetic Of Snakehead In Malaysia

KOD: 54038

JENIS: Siswazah

Ketua Penyelidik: Dr. Abol Munafi Ambok Bolong

ID Pegawai:

1. Objektif:

- To establish protocol to analyze snakeheads using RAPD technique.
- To detect genetic variation among snakehead species in Malaysia including *C. bankanensis*, *C. maruloides*, *C. melasoma*, *C. lucius*, *C. gachua*, *C. micropeltes*, *C. striatus*.
- To detect genetic populations of snakehead (*C. striatus*) in Eastern (Terengganu), Western North (Perlis), Center (Perak) and South (Johor) of Peninsular Malaysia.

2. Pelaksanaan Projek

a). Kegiatan Projek:

Genitic variation of snakehead species (*Channa bankanensis*, *C. maruloides*, *C. melasoma*, *C. lucius*, *C. gachua*, *C. micropeltes*, and *C. striatus* has just finished analysis using Random Amplified Polymorphism method.

b). Kemajuan projek secara keseluruhan:

- Six snakehead species and 4 populations sampled.
- Genome has been extracted using QIAGEN DNeasy tissue kit.
- Polymerase Chain Reaction has been conducted.

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

None

d). Program kerja masa hadapan:

- Genetic population fish specimens from each location (Terengganu, Perlis, Perak and Johor) will be amplified using RAPD technique.
- Data will be computed to find out genetic variation among snakehead species.

BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	-	-	-
Perjalanan (2100)	3,000	56.78	2943.22
Bekalan dan Bahan (2700)	15,000	16,681	0
Jumlah Besar	18,000	16,737.78	2943.22

BAHAGIAN III: MAKLUMAT PENYELIDIK

Fakulti / Pusat / Bahagian: Fakulti Sains dan Teknologi

Jabatan: Jabatan Perikanan dan Sains Samudera

Ketua Penyelidik: Dr. Abol Munafi Ambok Bolong

Penyelidik Bersama: Prof.Dr. Mohd. Azmi Bin Ambak

Tandatangan Ketua Penyelidik:

DR. ABOL MUNAFI AMBOK BOLONG
Pensyarah

Tarikh: 24/10/02

Jabatan Perikanan dan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Mengabang Telipok
Kuala Terengganu

45

**BAHAGIAN IV: PENILAIAN JAWATANKUASA
PENYELIDIKAN FAKULTI/PUSAT/BAHAGIAN**

Jawatankuasa Fakulti / Pusat / Bahagian:

Laporan: [Memuaskan / Tidak Memuaskan]

Cadangan:

Tandatangan Pengerusi: J/K Penyelidikan Fakulti / Pusat / Bahagian

Tarikh:

Prof. Madya Dr. Nakisah binti Mat Amin
Timbalan Dekan (Penyelidikan dan Siswazah)
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Jawatankuasa Penyelidikan Universiti

Komen:

Tandatangan Pengerusi: J/K Penyelidikan Universiti

Tarikh:

Keputusan: Projek dilanjutkan / diberhentikan:



JABATAN MATEMATIK, FAKULTI SAINS DAN TEKNOLOGI

Memo

Daripada: TD CPPS) FST

Kepada : Sek. Penyelidikan

Tarikh: 30/10/62

Perkara

Laporan kemajuan
Penyelidikan Jangka Pendek

Bersama-sama ini disertakan
Laporan berkaitan dengan
En. Mustafa bin Mamat, FST

Terima kasih.

b/p

Prof. Madya Dr. Nakisah binti Mat Amin
Timbalan Dekan (Penyelidikan dan Siswazah)
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.



Laporan Kemajuan Penyelidikan Jangka Pendek

Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh 1 Julai 2002

Ke 30 September 2002

BAHAGIAN 1: MAKLUMAT PROJEK

TAJUK: Pekali Hasil Darab Berasaskan Penggangar – M

KOD: 54056

JENIS: Baru

Ketua Penyelidik: Mustafa bin Mamat

ID Pegawai:

1. **Objektif:** Menentukan Keefisienan pekali hasil darab penggangar – M

2. **Perlaksanaan Projek**

- a). Kegiatan Projek: Telah membina algoritma untuk melaksanakan aturcara berasaskan S- Plus. Programing akan diuji setelah mendapat software S-Plus. Pembelian sedang diurus.
- b). Kemajuan projek secara keseluruhan: Pada dasarnya lebih kurang 50% sudah selesai. Projek ini banyak melibatkan aturcara. Menguji dan memperbaiki aturcara akan dibuat kemudian.
- c). Masalah dihadapi / atau perubahan dalam perancangan kerja:
- d). Program kerja masa hadapan: Menguji aturcara yang dibina. Aturcara akan diubah dan diperbaiki.

Laporan Kemajuan Penyelidikan Jangka Pendek

BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	3000	3000	
Perjalanan (2100)	7800	-	7800
Bekalan dan Bahan (2700)	5200	-	5200
Jumlah Besar	16 000	3000	13 000

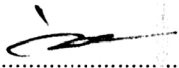
**BAHAGIAN III: MAKLUMAT
PENYELIDIK**

Fakulti / Pusat / Bahagian: Fakulti Sains dan Teknologi

Jabatan: Jabatan Matematik

Ketua Penyelidik: Mustafa bin Mamat

Penyelidik Bersama: Mohd Shafiih bin Lola
Sabri bin Ahmad

Tandatangan Ketua Penyelidik: 

Tarikh: 30 September 2002.....

**BAHAGIAN IV: PENILAIAN JAWATANKUASA
PENYELIDIKAN FAKULTI/PUSAT/BAHAGIAN**

Jawatankuasa Fakulti / Pusat / Bahagian:

Laporan: [Memuaskan / ~~Tidak Memuaskan~~]

Cadangan:

Tandatangan Pengerusi: J/K Penyelidikan Fakulti / Pusat / Bahagian

Tarikh: 27/10/2022

Prof. Madya Dr. Nakisah binti Mat Amin
Timbalan Dekan (Penyelidikan dan Siswazah)
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Jawatankuasa Penyelidikan Universiti

Komen:

Tandatangan Pengerusi: J/K Penyelidikan Universiti

Tarikh:

Keputusan: Projek dilanjutkan / diberhentikan:



**KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
[KUSTEM]**

Mengabang Telipot
21030 Kuala Terengganu

*Fakulti Sains dan Teknologi
(Faculty of Science and Technology)*

MEMORANDA PERHUBUNGAN

TARIKH : 7 Oktober 2002

KEPADA : SEKRETARIAT PENYELIDIKAN
KUSTEM
D/A INSTITUT OSEANOGRAFI (INOS)

DARIPADA : TIMBALAN DEKAN (P&S)
FAKULTI SAINS DAN TEKNOLOGI

**LAPORAN KEMAJUAN PENYELIDIKAN JANGKA PENDAK
UNTUK TEMPOH 1 JUN 2002 KE 31 MEI 2003**

Bersama-sama ini disertakan laporan seperti di atas daripada Prof. Madya Ir. Ahmad Jusoh sepertimana diperlukan.

Terima kasih.

Yang menjalankan tugas,


b/p

Prof. Madya Dr. Nakisah binti Mat Amin
Timbalan Dekan (Penyelidikan dan Siswazah)
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Bil.	Nama	Tajuk Projek	Status
1.	Prof. Madya Ir. Ahmad Jusoh	The removal of Ammonia using the Biofilter Treatment System in Treating the Wastewater from the Recycling Process of Intensive Fishpond.	Memuaskan



**KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
IKUSTEMI**

**Mengabang Telipot
21030 Kuala Terengganu**

*Fakulti Sains dan Teknologi
(Faculty of Science and Technology)*

MEMORANDA PERHUBUNGAN

TARIKH : 18 September 2002

KEPADA : SEKRETARIAT PENYELIDIKAN
KUSTEM
D/A INSTITUT OSEANOGRAFI (INOS)

DARIPADA : TIMBALAN DEKAN (P&S)
FAKULTI SAINS DAN TEKNOLOGI

**LAPORAN KEMAJUAN PENYELIDIKAN JANGKA PENDAK
UNTUK TEMPOH 1 JUN 2002 KE 31 MEI 2003**

Bersama-sama ini disertakan ^{sepuluh (10)} enam (6) laporan seperti di atas sepertimana diperlukan.

Terima kasih.

Yang menjalankan tugas,

Prof. Madya Dr. Nakisah Mat Amin

Bil.	Nama	Tajuk Projek	Status
1.	Pn. Hayati Mohd Yusof	Study of the relationship between traditional herbs consumption and nutritional status of Aborigines in Lembah Belum, Perak	Memuaskan
2.	Encik Mohd. Zamri Ibrahim	A Study of wind energy in KUSTEM Campus	Memuaskan
3.	Dr. Aziz Ahmad	Regeneration studies on Pelargonium radula	Memuaskan
4.	Encik Mohammad Fadhli Ahmad	Utilization of local resources in the development of reactive palm oil residue for pre-cast applications	Memuaskan
5.	Encik Muhamad Safiih Lola	The performance of bootstrap confidence intervals of correlation coefficient based on M-estimator	Memuaskan
6.	Puan Hasiah Salleh	Kajian Sifat Peranti Elektronik Bahan Polimer Mengkonduksi	Memuaskan
7.	Dr. Kamaruzaman Yunus	Geochemical proxy and accumulation of sediment in the Terengganu Mangrove Forest, Malaysia	Memuaskan
8.	Dr. Abol Munafi Ambok Bolong	Kajian Keupayaan Pembiakan Progeni Keli Kacukan, Warisan Genetik dan Daya Ketahanan Penyakit	Memuaskan
9.	Dr. Abol Munafi Ambok Bolong	Molecular Genetic of Snakehead in Malaysia	Memuaskan
10.	Abdul Fatah Abdul Wahab	Some Property of Smooth Fuzzy Topological Spaces	Memuaskan



**KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
[KUSTEM]**

**Mengabang Telipot
21030 Kuala Terengganu**

Fan

*Fakulti Sains dan Teknologi
(Faculty of Science and Technology)*

MEMORANDA PERHUBUNGAN

TARIKH : 18 September 2002

KEPADA : SEKRETARIAT PENYELIDIKAN
KUSTEM
D/A INSTITUT OSEANOGRAFI (INOS)

DARIPADA : TIMBALAN DEKAN (P&S)
FAKULTI SAINS DAN TEKNOLOGI

LAPORAN KEMAJUAN PENYELIDIKAN JANGKA PENDAK UNTUK TEMPOH 1 JUN 2002 KE 31 MEI 2003

Bersama-sama ini disertakan enam (6) laporan seperti di atas sepertimana diperlukan.

Terima kasih.

Yang menjalankan tugas,

Prof. Madya Dr. Nakisah Mat Amin

Bil.	Nama	Tajuk Projek	Status
1.	Pn. Hayati Mohd Yusof	Study of the relationship between traditional herbs consumption and nutritional status of Aborigines in Lembah Belum, Perak	Memuaskan
2.	Encik Mohd. Zamri Ibrahim	A Study of wind energy in KUSTEM Campus	Memuaskan
3.	Dr. Aziz Ahmad	Regeneration studies on Pelargonium radula	Memuaskan
4.	Encik Mohammad Fadhli Ahmad	Utilization of local resources in the development of reactive palm oil residue for pre-cast applications	Memuaskan
5.	Encik Muhamad Safiih Lola	The performance of bootstrap confidence intervals of correlation coefficient based on M-estimator	Memuaskan
6.	Puan Hasiah Salleh	Kajian Sifat Peranti Elektronik Bahan Polimer Mengkonduksi	Memuaskan

Bil.	Nama	Tajuk Projek	Status
1.	Prof. Madya Dr. Norhayati Mohd Tahir	Study on Distribution and Sources of Polycyclic Aromatic Hydrocarbons (PAHS) in soils of Terengganu and Pahang	Memuaskan
2.	Prof. Dr. Hamdan bin Suhaimi	Physicochemical properties of emulsions with MCT	Memuaskan
3.	Prof. Madya Dr. Mustafa bin Mat Deris	Neighbours-replica distribution pattern for web-server clusters	Memuaskan
4.	Encik Abdul Aziz bin K. Abdul Hamid	Implementing Temporal Risk Management in Government	Memuaskan
5.	Encik Muhamad Ariffin Mansor	Penyelidikan Terhadap Algorithma MPEG-4	Memuaskan
6.	Dr. Maged Mahmoud Marghany		Memuaskan
7.	Encik Amir bin Ngah	Alatan Perekasayaan Songsang: Penvisualan Program Visual Basic (Reverse Engineering Tool: Visualization of VB Program)	Tidak memuaskan
8.	Dr. Mohd Effendy bin Abd. Wahid	Pengesanan, pengasingan dan perbandingan analisis DNA Pasteurella sp. yang diasingkan daripada haiwan ruminan dan non-ruminan di kawasan endemic di Terengganu dan Kelantan	Memuaskan
9.	Cik Noraznawati Ismail	Randomly Amplified Polymorphic DNA (RAPD) profile – based measures as a bioindicator of environmental stress base on organic pollutants	Memuaskan
10.	Dr. Mohd Effendy bin Abdul Wahid	Pathogenesis jangkitan penyakit yang disebabkan oleh bakteria pada ikan air tawar yang dipelihara di bawah system kultur intensif	Memuaskan
11.	Dr. Abol Munafi bin Ambok Bolong	Molecular Genetic of Snakehead in Malaysia	Memuaskan
12.	Dr. Abol Munafi bin Ambok Bolong	Kajian Keupayaan Pembiakan Progeni Keli Kacukan, Warisan Genetik dan Daya Ketahanan Penyakit	Memuaskan

18/9/02

13.	Dr. Muthafar H. Mohamad	Surveillance of Important bacteria from Healthy and Diseased fresh pan fish in Terengganu	Memuaskan
14.	Dr. Ahmad Shamsudin bin Ahmad	Agihan beberapa logam berat di persiaran pantai Kemaman, Terengganu	Memuaskan
15.	Puan Laili binti Che Rose	Photoluminescence studies of singular and mixed ionic surfactants in microemulsion systems	Memuaskan
16.	Encik Mohd Sarif Abd. Manap	Faktor-faktor Penghalang Terhadap penggunaan Blackboard di Kalangan Pensyarah UMS, Univ. Tek. Petonas dan KUSTEM	Memuaskan
17.	Dr. Paymon Roustaian	Preliminary investigation on application of hormones in larviculture of prawn, Macrobrachium rosenbergii	Memuaskan
18.	Puan Noraida binti Ali	Pencaman Bentuk Menggunakan Rangkaian Neural	Memuaskan
19.	Prof. Madya Dr. Noor Azhar bin Mohamed Shazili	Toxicity of cadmium, copper and zinc singly and in combination to the seabass, Lates calcarifer	Memuaskan
20.	Dr. Misbahul Mohd Amin	Influence of Coastal Environments on Oxidation Behaviour of Metallic Metals and Alloys	
21.	Encik Suhaimi Suratman	Menentukan taburan nutrien dan logam di muara sungai Besut dan Paka	Memuaskan
22.	Encik Yosza	Masalah Pengaturcaraan Kuadratik	Memuaskan
23.	Cik Norhayati Ibrahim	Lipid oxidation status of selected fresh and preserved Malaysian fish with respect to their phospholipids and tocopherols content	Memuaskan
24.	Dr. Amiza Mat Amin	Penghasilan Produk bertambah nilai daripada biji durian (Durio zibethinus)	Tidak memuaskan
25.	Puan Masila @ Masita Abdul Jalil	Pembangunan Model Simulasi untuk Penjadualan Pendaratan Kapal di Pelabuhan	Memuaskan
26.	Cik Che Noor Azliza binti Che Mat	Designing a Frame Work for Data Mining Tool For Web Server	Memuaskan

27.	Encik Wan Mohd Norsani bin Wan Nik	Investigation of Oxidation and Corrosion Performance of Vegetable Oil	Memuaskan
28.	Cik Hayati binti Mohd Yusof	Hubungan di antara status pemakanan ibu dengan status pemakanan anak (11 – 12 thn) di kawasan Pendalaman: Kajian di Hulu Terengganu	Memuaskan
29.	Dr. Kamaruzzaman Yunus	Geochemical proxy and accumulation of sediment in the Terengganu mangrove forest, Malaysia	Memuaskan
30.	Dr. Muhammad Suzuri bin Hitam	Pembangunan Sistem Penghitug Koloni Automatik Kos Rendah	Memuaskan
31.	Encik Sumazly Sulaiman	Building An Ideal University Model for Mobile Information Services Using WAP	Memuaskan
32.	Dr. Zaleha binti Kasim	Benthic communities of coastal ecosystems in Malaysia and their response to the environment distrurbance	Memuaskan
33.	Prof. Madya Dr. Guruprasad A. Sulebele	Incidence of <i>Bacillus cereus</i> food poisoning in some Malaysian foods and its prevention	Memuaskan
34.	Encik Liew Hock Chark	Biology and Ecology of Exploited Seahorses in Peninsular Malaysia	Memuaskan
35.	Prof. Madya Dr. Norhayati Mohd Tahir	Hydrocarbons Distributions in sediments found in the coastal areas of Penggerang, Johore.	Memuaskan
36.	Prof. Madya Dr. Norhayati Mohd Tahir	Selected trace metals content and its mobility in soils around Terengganu	Memuaskan
37.	Dr. Ahmad Shamsudin bin Ahmad	Agihan Beberapa Logam Berat di Persisiran Pantai Kemaman, Terengganu	Memuaskan



KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
MENGABANG TELIPOT, 21030 KUALA TERENGGANU, MALAYSIA.

13

Fakulti Sains dan Teknologi

MEMO PERHUBUNGAN

KEPADA : Cik Zakiah

IKIOS

DARIPADA : Pembantu Khas Kepada TD (PPS), FST

PERKARA : Laporan Kemajuan
Penyelidikan Tangka
Pande, Pembelajaran
Mestika (PPB)

☐ Untuk tandatangan

☒ Untuk perhatian/simpanan

☒ Untuk edaran / makluman / tindakan

☐ Untuk fotostat (.....salinan)

☐ Fail mesyuarat

NOTA:

T. Q. Pn. Mariah Jusoh

13/8/02

Laporan Kemajuan Penyelidikan Jangka Pendek

Panduan Penyerahan Laporan

- Semua laporan hendaklah di hantar kepada Sekretariat Penyelidikan KUSTEM melalui Jawatankuasa Penyelidikan Fakulti/Pusat/ Bahagian setelah penilaian di buat oleh jawatan kuasa tersebut.
- Semua laporan hendaklah dihantar selepas 6 bulan projek dijalankan.

Untuk tempoh 1 April 2002 Ke 1 April 2003

BAHAGIAN 1: MAKLUMAT PROJEK

TAJUK: Pembelajaran Matematik Tambahan dengan menggunakan pengajaran dan pembelajaran berbantu komputer (PPBK)

KOD: 54048

JENIS: Baru

Ketua Penyelidik: Sabri bin Ahmad

ID Pegawai:

1. Objektif:

- 1) Meningkatkan keberkesanan pengajaran guru dalam Matematik Tambahan.
- 2) Meningkatkan keberkesanan pembelajaran pelajar dalam Matematik Tambahan.
- 3) Meningkatkan minat dan pencapaian pelajar dalam Matematik Tambahan.

2. Pelaksanaan Projek

a). Kegiatan Projek:

- i) Sedang menyiapkan skrip (nota) beberapa tajuk dalam mata pelajaran Matematik Tambahan.
- ii) Membina perisian Matematik Tambahan dengan program micromedia
- iii) Mencari bahan-bahan untuk literature review.

b). Kemajuan projek secara keseluruhan:

- Secara amnya penyelidikan ini dapat disiapkan dalam 40%.

c). Masalah dihadapi / atau perubahan dalam perancangan kerja:

- i) Memerlukan masa yang agak lama membina perisian Matematik Tambahan.
- ii) Sukar untuk mendapatkan pembantu penyelidik yang dapat membina perisian dengan baik.

d). Program kerja masa hadapan:

- i) Menyiapkan beberapa pakej pembelajaran Matematik Tambahan (beberapa tajuk dalam (Matematik Tambahan).
- ii) Membuat kajian 'pilot' di sebuah sekolah menengah menggunakan perisian yang dibina.



BAHAGIAN II: PERUNTUKAN

Peruntukan Diluluskan

Kod	Jumlah (RM)	Perbelanjaan (RM)	Baki (RM)
Gaji Pekerja (2900)	3000		
Perjalanan (2100)	8800		
Bekalan dan Bahan (2700)	4200		
Jumlah Besar	RM16000.00		

**BAHAGIAN III: MAKLUMAT
PENYELIDIK**

Fakulti / Pusat / Bahagian: Fakulti Sains dan Teknologi

Jabatan: Jabatan Matematik, Fakulti Sains dan Teknologi KUSTEM.

Ketua Penyelidik: Sabri bin Ahmad

Penyelidik Bersama: En. Mohamad Safiih Lola
Tn. Hj Mustafa Mamat

Tandatangan Ketua Penyelidik: 

Tarikh: 1/8/2002

**BAHAGIAN IV: PENILAIAN JAWATANKUASA
PENYELIDIKAN FAKULTI/PUSAT/BAHAGIAN**

Jawatankuasa Fakulti / Pusat / Bahagian:

Laporan: [Memuaskan / Tidak Memuaskan]

Cadangan: Perlu membuat perancangan yg. lebih teliti.
Dan nyatakan mana yg. diperlukan utk membina
perisian MT dan allocate mana yg. utk itu. Jika
tidak, ini mungkin menyalahi proses penyelidikan.

Tandatangan Pengerusi: J/K Penyelidikan Fakulti / Pusat / Bahagian

Prof. Madya Dr. Nakisah binti Mat Amin
Timbalan Dekan (Penyelidikan dan Siswazah)
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Tarikh:

Jawatankuasa Penyelidikan Universiti

Komen:

Tandatangan Pengerusi: J/K Penyelidikan Universiti

Tarikh:

Keputusan: Projek dilanjutkan / diberhentikan:



MEMO

Tarikh: 15hb. Ogos 2002

Kepada:

Semua Pensyarah / Penyelidik
Fakulti Sains dan Teknologi (FST)
Fakulti Pengurusan dan Ekonomi (FPE)
KUSTEM

Assalamualaikum wbt. dan Salam Sejahtera,

**PERINGATAN: POLISI PEMBELIAN DAN PERUNTUKAN TAMBAHAN
PENYELIDIKAN JANGKA PENDEK 2002 KUSTEM.**

Dengan segala hormatnya, saya merujuk kepada perkara tersebut di atas.

Sukacita dimaklumkan bahawa segala permohonan perbelanjaan dan tambahan perbelanjaan pembelian aset atau keperluan (contohnya komputer, kamera, printer dan lain-lain), hendaklah mendapat **kelulusan dari Jawatankuasa Penyelidikan KUSTEM**. Segala permohonan hendaklah **disalurkan melalui Sekretariat Penyelidikan KUSTEM**. Sekiranya prosedur ini tidak diikuti, pihak Bendahari bertanggungjawab untuk membatalkan permohonan tuan/puan.

Bersama-sama ini dilampirkan Peraturan Penyelidikan Jangka Pendek 2002 KUSTEM untuk perhatian tuan/puan.

Sekian untuk makluman dan tindakan tuan/puan seterusnya. Terima kasih.

Yang benar,

(SHAHARUL SUHAILA HJ. ISMAIL)

Pegawai Sains INOS

b/p Sekretariat Penyelidikan KUSTEM.

s.k:

- Timbalan Dekan Penyelidikan FST (up: Prof. Madya Dr. Nakisah Mat Amin)
- Timbalan Dekan Penyelidikan FPE (up: Dr. Fauziah Abu Hassan)
- Bendahari (up: Cik Salwati)
- Fail

PERATURAN PENYELIDIKAN JANGKA PENDEK

- (a) Geran ini adalah untuk menampung kos perkhidmatan, bahan-bahan dan bekalan, perjalanan (dalam negara sahaja) dan pembelian peralatan kecil.
- (b) Perkhidmatan iktisas atau pakar perunding adalah tidak dibenarkan.
- (c) Penyelidik tidak dibenarkan membuat perbelanjaan ubahsuai atau menyewa bangunan dan makmal.
- (d) Penyelidik tidak dibenarkan menggunakan wang ini untuk perjalanan luar negara.
- (e) Jumlah peruntukan yang diluluskan untuk satu projek ialah tidak melebihi RM25,000.
- (f) Pembelian komputer dan sewa komputer tidak dibenarkan melalui peruntukan ini kecuali kelulusan telah diberi oleh Jawatankuasa Penyelidikan semasa permohonan dibentangkan.
- (g) Seorang pegawai hanya dibenarkan memohon satu geran projek penyelidikan jangka pendek pada satu masa, melainkan mereka yang mempunyai pelajar siswazah.
- (h) Sebarang pertukaran tajuk projek penyelidikan yang akan dijalankan mestilah mendapat kelulusan Jawatankuasa Penyelidikan terlebih dahulu.
- (i) Peruntukan yang diluluskan adalah untuk tempoh 12 bulan mulai tarikh peruntukan diterima dan peruntukan yang tidak habis digunakan akan dikira luput setelah tamat tempoh tersebut diatas.
- (j) Semua peruntukan yang diluluskan akan mempunyai akaun sendiri.



KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

Mengabang Telipot, 21030 Kuala Terengganu

Institut Oseanografi

MEMO

Tarikh: 7hb. Ogos 2002

Kepada:

Semua Pensyarah / Penyelidik
Fakulti Sains dan Teknologi (FST)
Fakulti Pengurusan dan Ekonomi (FPE)
KUSTEM

Assalamualaikum wbt. dan Salam Sejahtera,

PENGHANTARAN LAPORAN KEMAJUAN DAN AKHIR PENYELIDIKAN JANGKA PENDEK KUSTEM 2002.

Dengan segala hormatnya, saya merujuk kepada perkara tersebut di atas.

Sukacita dimaklumkan bahawa berkuatkuasa dari tarikh **1hb. Ogos 2002**, tuan/puan dikehendaki menghantar **laporan kemajuan setiap 3 bulan** sekali dan **laporan akhir** selepas sebulan projek dijalankan.

Bersama-sama ini dilampirkan Jadual penghantaran laporan-laporan tersebut (mengikut Pusingan masing-masing) untuk perhatian tuan/puan.

Sekian untuk makluman dan tindakan tuan/puan seterusnya. Terima kasih.

Yang benar,

(SHAHARUL SUHAILA HJ. ISMAIL)

Pegawai Sains INOS

b/p Sekretariat Penyelidikan KUSTEM.

s.k:



- Timbalan Dekan Penyelidikan FST (up: Prof. Madya Dr. Nakisah Mat Amin)
- Timbalan Dekan Penyelidikan FPE (up: Dr. Fauziah Abu Hassan)
- Fail

JADUAL PENGHANTARAN LAPORAN KEMAJUAN DAN LAPORAN AKHIR PENYELIDIKAN JANGKA PENDEK KUSTEM 2002

LAPORAN	Pusingan 1 Tempoh: 1/4/02 - 31/3/03	Pusingan 2 & 3 Tempoh: 1/6/02 - 31/5/03	Pusingan 4 Tempoh: 10/8/02 - 31/7/03
<i>Laporan Kemajuan & Kewangan</i>	Q1: 30hb. Julai 2002 Q2: 30hb. Oktober 2002 Q3: 30hb. Januari 2003	Q1: 30hb. September 2002 Q2: 30hb. Disember 2002 Q3: 30hb. Mac 2003	Q1: 30hb. November 2002 Q2: 27hb. Februari 2003 Q3: 30hb. Mei 2003
<i>Laporan Akhir</i>	30hb. April 2003	30hb. Jun 2003	30hb. Ogos 2003

Sebarang masalah, sila hubungi :
 Sekretariat Penyelidikan KUSTEM
 INOS
 (Ext. 3385/3384)

SEGERA*Fakulti Sains dan Teknologi
(Faculty of Science and Technology)*

Rujukan Kami : KUSTEM/L/TD(PPS)/2-2/2/1

Tarikh : 30 Oktober 2001

Prof. Madya Dr. Mohd Lokman Husain

Prof. Madya Dr. Mohd Kamil Abdul Rashid

Prof. Madya Dr. Ismail Mohd

Prof. Madya Dr. Syed Mohd Zain Syed Hassan

Prof. Madya Dr. Awang Soh Mamat

Dr. Abol Munafi Ambok Bolong

Dr. Siti Aishah Abdullah (Prof. Dr. Ang Kok Jee)

Tuan/Puan,

**LAPORAN PENYELIDIKAN UPM 2001
UPM RESEARCH REPORT 2001**

Dengan segala hormatnya perkara di atas adalah dirujuk.

Adalah dimaklumkan bahawa menurut rekod daripada Sekretariat IRPA UPM, tuan/puan masih lagi belum menghantar Laporan IRPA RM-7.

Oleh yang demikian, tuan/puan disaran agar memenuhi borang yang terlampir atau mendapatkan borang penyelidikan tersebut di alamat/laman web : <http://uru.upm.edu.my/Borang/Researchgrants.nsf?open> untuk tuan/puan menghantar terus ke Sekretariat Penyelidikan, UPM Serdang **tidak lewat dari 4 November 2001**. Sila hantar satu salinan kepada Pejabat Dekan untuk simpanan.

Bersama-sama ini disertakan senarai no. projek untuk perhatian dan tindakan pihak tuan/puan selanjutnya.

Tindakan bersegera dari tuan/puan amatlah dihargai dan segala kerjasama tuan/puan dalam perkara ini saya dahului dengan ribuan terima kasih.

Sekian, untuk makluman dan tindakan pihak tuan/puan jua.

Saya yang menjalankan tugas,



(PROF. DR. HAMDAN SUHAIMI)

Timbalan Dekan

Fakulti Sains dan Teknologi

- s.k. - Y. Bhg. Prof. Dato' Rektor
- Dekan, FST
- FAIL

IRPA CYCLE 1997 PROJECTS

BIL	NO. PROJEK	KETUA PROJEK
1.	01-02-04-0262	Prof. Madya Dr. Mohd Lokman Husain
2.	08-02-04-0014	Prof. Madya Dr. Mohd Kamil Abdul Rashid

IRPA CYCLE 1996 PROJECTS

BIL	NO. PROJEK	KETUA PROJEK
1.	09-02-04-0014	Prof. Madya Dr. Ismail Mohd
2.	01-02-04-0152	Dr. Siti Aishah Abdullah (Prof. Dr. Ang Kok Jee)
3.	01-02-04-0011	Prof. Madya Dr. Syed Mohd Zain Syed Hassan
4.	01-02-04-0010	Prof. Madya Dr. Awang Soh Mamat
5.	01-02-04-0164	Dr. Abol Munafi Ambok Bolong



Universiti Putra Malaysia Research Report 2001

Extended Abstract Form (Electronic submission)

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Guidelines on preparation of Abstracts

- One or more abstracts may be prepared from each IRPA project, on the form below (MS Word, Windows 95/98 version) using a PC system. Individuals may appear as first author on one submitted abstract only, but may appear as co-author on up to three further abstracts.
- The Abstract including other information requested such as List of Publications and Expertise Development should **NOT** exceed 125 lines or **TWO** pages and be in single space (Times New Roman Font Size 9).
- Avoid Acronyms and Abbreviations.
- Enter all information within the square brackets []. The space within the bracket will expand to accommodate your needs, but do not exceed the number of lines indicated for each section.

Guidelines on submission of Abstracts

All abstracts should be submitted by **27 October 2001** as an e-mail attachment.

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CC: Deputy Dean Research of your Faculty.

Subject line: IRPA Project No (10-digits): and Name of the first author

IRPA Project number: [] Project Leader []

Abstract Title : []

Author Name(s): []

Faculty/Centres/Institutes: []

E-mail of Corresponding Author: []

Key words: [] List five keywords to be used for indexing

Introduction: (20 lines): []

Materials and Methods: (20 lines): []

Results and Discussion: (40 lines): []

Conclusions: (10 lines): []

Benefits from the study: (10 lines) []

Literature cited in the text (e.g. Normah MN, Chin HF, and Hor YL. 1987. Desiccation and cryopreservation of embryonic axes of *Hevea brasiliensis*. *Pertanika*. 9: 229-303.) *[Please follow this format for your entries below]*

- [1.]
- [2.]
- [3.]
- [4.]

Project Publications in Refereed Journals: (e.g. Normah MN, Chin HF, and Hor YL. 1987. Desiccation and cryopreservation of embryonic axes of *Hevea brasiliensis*. *Pertanika*. 9: 229-303.) *[Please follow this format for your entries below]*

- [1.]
- [2.]
- [3.]
- [4.]

Project Publications in Conference Proceedings: (e.g. Hussein MY, Hassan ST, Sajap AS, Norani Abdul Samad. 1992. Practical application of plant diversity for pest management in chilli ecosystem. In: Proceedings of the Persidangan Ekologi Malaysia 1, 1992; p127-132.) *[Please follow this format for your entries below]*

- [1.]
- [2.]
- [3.]

<i>Expertise Development</i>				
1.	Name of Graduate	Degree Awarded	Field of Expertise	Graduation Year
2.				
3.				
4.				

IRPA Project No: 01-02-04-0011
Status Project: Completed
Duration: 1966 - 1999



Evaluation and Utilisation of *Solanum* spp. Germplasms

Sayed Mohamed Zain Hasan
Jabatan Sains Biologi,
Kolej Universiti Sains dan Teknologi Malaysia,
Mengabang Telipot, 21030 Kuala Terengganu.

Introduction

Eggplant (*Solanum melongena* L.) is one the most important horticultural species from the genus *Solanum*. Nowadays it is grown world wide as a commercial fruit-vegetable with Southeast Asia became a centre of origin and distribution of the species. Taxonomically, it is very complicated species comprising various cultivated, weedy and wild forms, which are always overlapping from one group with another group.

Eggplant production is always limited by bacterial wilt disease caused by *Burkholderia* (*Pseudomonas*) *solanacearum* (Hasan, 1997). This systemic disease could not be eliminated by conventional methods of disease control. The most effective method for combating this disease is through hybridisation by producing high resistant variety (Zumaliawati, 2000).

The use of Effective Micro-organisms (EM) has also been recommended as an alternative method to control the bacterial wilt disease. EM is a mixed culture of beneficial micro-organisms which are able to provide a favourable microbiological equilibrium in the plant rhizosphere and then help to control the disease (Hasan and Abdullah, 1998).

It is very important to evaluate the eggplant germplasms and analyse the inheritance of bacterial wilt resistant gene and cross-ability relationship among the taxa in order to identify genotypes with useful characters for the crop improvement. Therefore, the study was conducted with the following objectives,

- i. to assess the variability of morph-agronomic traits present in *Solanum* spp. genetic resources collected throughout Malaysia and abroad
- ii. to assess the level of bacterial wilt resistant within the eggplant germplasm for selecting genotypes with high level of resistance against the disease
- iii. to analyse seed protein profile of eggplant genotypes by gel electrophoresis and the possibility of using the profile for cultivar identification
- iv. to evaluate the inheritance and performance the resistance gene by analysing the vigour (heterosis) in the hybrids
- v. to find out eggplant genotype that could possibly be used as a sources of parents to produce high resistance cultivar against bacterial wilt disease

- vi. to assess the effect of Effective Micro-organisms (EM) on bacterial wilt establishment as an alternative means to control the disease.

Materials and Methods

Seed samples of eggplant germplasms of about 400 accessions representing diverse agro-ecological areas in Malaysia and abroad obtained from previous collection were used in this study. The seeds were stored in refrigerator at below than 5 ° C and the accession data were systematically recorded according to the IBPGR protocol.

Evaluation of morphological and physiological variability was conducted on plants grown mostly in pots, irrigated and fertilised by using drip-irrigation system. The evaluations were made using a set of characters mostly selected from the IBPGR descriptor (1988) for the eggplant. List of accessions and characters used are presented in Hasan and Abdullah (1997).

Screening for bacterial wilt resistance was only conducted under the greenhouse condition. The plants were watered and fertilised by using drip-irrigation system. Inoculation of bacteria suspension was done through the stem at the third leaf axial. Wilting symptom was then recorded according to the number of day they arise and number of plant effected to classify genotype into various level of resistant against the disease (Hasan and Abdullah, 1997).

For electrophoresis study, seed protein profile from 54 accessions of eggplant representing a range of agro-geographical and morphological forms were assessed using the technique of SDS-polyacrylamide gel electrophoresis (SDS-PAGE) of seed protein. Details of protein sample extraction from seeds, gel preparation and electrophoresis operation have been explained in Hasan and Isa (1998).

Analysis on inheritance of bacterial wilt resistant gene and some other agronomic characters were made on six selected high resistance parents and their hybrids. The genotypes were grown and hand or controlled crossing was then made among the genotypes. The level of hybrid vigour (heterosis) and the parental combining ability for the character was then calculated to identify the promising parents and hybrids for crop improvement (Zumaliawati, 2000).

Examination on the effect of effective micro-organisms (EM) was carried out in the cultivated field previously infested with the bacterial wilt disease. The susceptible variety was randomly grown in homogenised 5 x 5 m plot treated with either EM or fertiliser Ca (NO₃)₂ alone or EM + Ca (NO₃)₂. The incidence of the bacterial wilt was then monitored for every week until the end of the season (Hasan and Abdullah, 1998).

Results and Discussions

Morphological and physiological variability as measured by the coefficient of variation showed a wide range of diversity for many characters. Number of days to germination, flowering and harvested fruit formation ranged between 4 - 39, 64 - 173 and 97 - 192 days respectively. Plant height ranged from 25 - 140 cm, flower number

per cluster ranged between 1 - 6. Fruit shape varies from round, pear- and club-shape to oblong and cylindrical meanwhile fruit colour varies from white, green, yellow, purple to deep purple (Hasan and Abdullah, 1997). These characters could arbitrarily distinguish eggplant complex into advanced and primitive cultivars, weedy and wild groups of eggplant.

The result of bacterial wilt screening also showed a wide variation of the resistance degree present in the genetic resources of eggplant used in this study. Out of 111 accessions tested about 8% were fairly high resistance, 16% were moderate resistance and 76% were susceptible against the disease (Hasan and Abdullah, 1997).

The profiles of SDS-PAGE of seed protein revealed a great variation within and between the groups of eggplant. There are 14 protein banding patterns characterising the genotypes of eggplant into advanced cultivar of large elongated, pear- and club-shape and round fruits, primitive cultivar with small fruit, prickly wild and weedy habit and ancestor species of *Solanum incanum* groups. The profiles are reproducible and can be used as a marker for cultivar identification that can be performed within a couple of hours without necessity of growing out the plants (Hasan and Isa, 1998).

The results of screening test on the hybrids derived from hybridisation of resistant parents revealed that the resistant shown by some hybrids were much higher than the level possessed by their parents. The performance of most agro-morphological characters, such as fruit weight and size and total yield, in the hybrids were also significantly higher than their parents. This exhibited that hybrid vigour (heterosis) was expressed in the hybrid by those characters, and thus such gene, particularly the resistant gene against bacterial wilt disease, could be accumulated into the progeny through hybridisation for the further improvement (Zumaliawati, 2000).

The use of EM in combination with fertiliser Ca (NO₃)₂ capable to delay the establishment of the disease in eggplant and that would allow the crop to produce yield profitably before the disease reaches a critical levels. This method, however, could not eliminate the diseases completely (Hasan and Abdullah, 1998).

Conclusion

The study was successfully differentiate and organise the complicated variability of the eggplant (*Solanum melongena* L.) into modern and primitive cultivars, wild and weedy groups on the basis of agro-morphological features and protein banding patterns. This grouping was useful for the purpose of breeding programme of the crop. This study is also successful in identifying several resistant genotypes against bacterial wilt symptom and capable to accumulate the traits through hybridisation of moderate resistance parents.

Presently, all seeds materials of the germplasms (accessions) collected since early 80's and their hybrids/progenies were stored in refrigerator at below 5° C in the Department of Biological Science, KUSTEM, Terengganu. The materials were kept under the same condition in UPM Serdang before they were brought together with their passport data into KUSTEM in 1998 following transference of the key researcher from UPM to KUSTEM.

Publications

A. Journal

1. Hasan, S.M.Z and Abdullah, H. (1997) Evaluation and variability in eggplant (*Solanum melongena* L.) complex in Malaysia. **Malaysian Applied Biology**. **26** (1): 55 - 61.
2. Hasan, S.M.Z and Abdullah, H. (1998) Effects of effective microorganisms (EM) and calcium nitrate ($\text{Ca}(\text{NO}_3)_2$) on bacterial wilt establishment in eggplant (*Solanum melongena* L.). **Capsicum and Eggplant Newsletter**. **17**: 88 - 91.
3. Hasan, S.M.Z. and Isa, M. L. (1998) Variability in eggplant (*Solanum melongena* L.) and its nearest wild species as revealed by polyacrylamide gel electrophoresis of seed protein. **Pertanika J. Tropical Agricultural Science**. **21** (2): 113 - 122.
4. Hasan, S.M.Z. (1997) Terung dan Masalah Layu Bakteria. **Jambatan**. (6): 3 - 5.
5. Usman, I.S., Mamat, A.S, Mohd Hasan, S.Z.S, Aishah, S.H and Anuar, A.R (1999). The non-impairment of pollination and fertilization in the abscission of chilli (*Capsicum annuum* L. Var. Kulai) flowers under high temperature and humid conditions. **Scientia Horticulture**. **79**: 1 - 11.

B. Thesis Supervision (Master Agric. Sc.)

1. Zumaliawati M. R. (2000) Study on the heterosis and genetic relationship of bacterial wilt resistant in eggplant (*Solanum melonegena* L.). M. Sc. (Agr. Sc) thesis progress report (Final writing stage).

C. Final Year Under-Graduated Projects Supervision (B. Sc (Agr. Sc)/ (Biology)

1. Noraini Abd. Hamid (1996) Kawalan penyakit layu bacteria pada janaplasma terong (*Solanum melogena* L.). Thesis BSc (Agr. Sc). UPM, Serdang.
2. Aswadi Adnan (1997) Heterosis dalam hybrid kultivar-kultivar terong (*Solanum melonegena* L.) B.S. Agr. Sc. UPM Serdang.
3. Ng Siew Kim (1998) Heterosis investigation in F1 hybrid of eggplant (*Solanum melonegena* L.). Thesis BSc. (Hons) in Biologi. UPMT.
4. Wong Kek Weng (1998) Kajian kebolehan berhibrid antara beberapa kultivar terong (*Solanum melogena* L.). Thesis BSc. (Hons) in Biologi. UPMT.

D. Seminar (Abstract)

Hasan, S.M. Z and Abdullah, H (1997) control of bacterial wilt of Eggplant (*Solanum melogena* L.) by effective microorganism (EM) and Calcium Nitrate ($\text{Ca Co}_3)_2$). The 20th Symposium of Malaysia Society for microbiology for Sustainable Environment. June 1-3.1997. MINT/MSM. Port Dickson, N.S.

End of Project Report

10

A. Project number: 01 - 02 - 04 - 011

Project title: Evaluation and utilization od *Solanum* spp. germplasms.

Project leader: Assoc. Prof. Dr. Sayed Mohamed Zain S. Hasan

Tel: 09-6683133/3244

Fax: 09-6694660

B. Summary for the MPKSN Report (For publication in the Annual MPKSN Report, please summarise the project objectives, significant results achieved, research approach and team strucure)

- See attached paper -

77

C. Objectives achievement

- **Original project objectives** (Please state the specific project objectives as described in Section II of the Application Form)

1. To identify genotype of eggplant and other related species that posses resistant traits against bacterial wilt disease caused by *Pseudomonas solanacearum*.
2. To identify the crossable wild species of *Solanum* to cultivated eggplant.
3. To preserves *Solanum* spp. germplasms.

- **Objectives Achieved** (Please state the extent to which the project objectives were achieved)

Almost 100 % achieved

- **Objectives not achieved** (Please identify the objectives that were not achieved and give reasons)

-

D. Technology Transfer/Commercialisation Approach (Please describe the approach planned to transfer/commercialise the results of the project)

1. The original germplasm and their progenies conserved in our storage can readily be used either directly for the crop production or as a parent in the breeding programme.
2. The pollination technique of the crop can be adopted easily by ordinary farmers using a simple tool, such as tumb nail, to transfer beneficial genes (traits) by hybridization or crossing of the selected genotypes.
3. Improved hybrid seeds will be made available after field trial was carried.

E. Benefits of the Project (Please identify the actual benefits arising from the project as defined in Section III of the Application Form. For examples of outputs, organisational outcomes and sectoral/national impacts, please refer to Section III of the Guidelines for the Application of R&D Funding under IRPA)

- **Outputs of the project and potential beneficiaries** (Please describe as specifically as possible the outputs achieved and provide an assessment of their significance to users)

1. Provide basis for eggplant grouping that require in crossing programme.
2. Identifying several genotypes that resistance against bacterial wilt disease which is a valuable sources for improvement of the crop combating the disease.
3. Storing a large amount of genetic diversity of the crop for the future use.
4. Provide new knowledge about genetic relationship between wild and cultivated species of eggplant that similar technique could be used in studying evolution and domestication of crop species.

- **Organisational Outcomes** (Please describe as specifically as possible the organisational benefits arising from the project and provide an assessment of their significance)

1. The knowledge, technique and apparatus set up during the studying is unvaluable sources for teaching and research in the field of genetic, taxonomy and crop sciences.
2. Through paper publication will make the organization is well known and establish.

- **National Impacts** (If known at this point in time, please describe as specifically as possible the potential sectoral/national benefits arising from the project and provide an assessment of their significance)

F. Assessment of project structure

- **Project Team** (Please provide an assessment of how the project team performed and highlight any significant departures from plan in either structure or actual man-days utilised).

Through student research project for Master and Bachelor degrees.

- **Collaborations** (Please describe the nature of collaborations with other research organisations and/or industry)

G. Assessment of Research Approach (Please highlight the main steps actually performed and indicate any major departure from the planned approach or any major difficulty encountered)

Through student research project for Master and Bachelor degrees.

H. Assessment of the Project Schedule (Please make any relevant comment regarding the actual duration of the project and highlight any significant variation from plan)

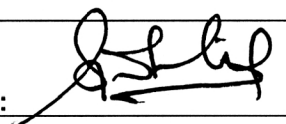
I. Assessment of Project Costs (Please comment on the appropriateness of the original budget and highlight any major departure from the planned budget)

Appropriates.

J. Additional Project Funding Obtained (In case of involvement of other funding sources, please indicate the source and total funding provided)

K. Other Remarks (Please include any other comment which you feel is relevant for the evaluation of this project)

Date: 3 September 2001

Signature: 

OLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

[KUSTEMI]

Mengabang Telipot
21030 Kuala Terengganu

9

Fakulti Sains dan Teknologi

Rujukan Kami : KUSTEM/FST/L/TD (PPS)/2-2/2/1

Tarikh : 27 Ogos 2001

Prof. Madya Dr. Noor Azhar bin Mohd Shazili
Prof. Madya Dr. Sakri bin Ibrahim
Prof. Madya Dr. Sayed Mohamed Zain bin Sayed Hassan
Prof. Madya Dr. Awang Soh bin Mamat
Dr. Abol Munafi Ambok Bolong
Dr. Siti Aishah bt Abdullah
Fakulti Sains dan Teknologi

Tuan/Puan,

DAFTAR PROGRES PENYELIDIKAN IRPA

Dengan segala hormatnya merujuk kepada perkara di atas.

Dimaklumkan bahawa tuan/puan masih belum menghantar "Daftar Progres Penyelidikan IRPA Cycle 1996".

Oleh yang demikian, tuan/puan disaran agar dapat menyegerakan penghantaran daftar progres tersebut kerana satu pembentangan Projek IRPA RM-7 akan diadakan dalam sedikit masa lagi. Sila sertakan bersama disket tuan/puan.

// Bersama-sama ini dikembalikan senarai no. projek untuk rujukan dan tindakan tuan/puan seterusnya.

Segala kerjasama tuan/puan dalam hal ini saya dahului dengan ribuan terima kasih.

Sekian, terima kasih.

Saya yang menjalankan tugas,



(**PROF. DR. HAMDAN BIN SUHAIMI**)

Timbalan Dekan
Fakulti Sains dan Teknologi

s.k - Dekan, FST
- FAIL

BIL	NO. PROJEK	KETUA PROJEK
1.	08-02-04-0039	Prof. Madya Dr. Noor Azhar bin Mohd Shazili
2.	09-02-04-0039	Prof. Madya Dr. Noor Azhar bin Mohd Shazili
3.	08-02-04-0038	Prof. Madya Dr. Sakri bin Ibrahim
4.	01-02-04-0011	Prof. Madya Dr. Sayed Mohamed Zain bin Sayed Hassan
5.	01-02-04-0010	Prof. Madya Dr. Awang Soh bin Mamat
6.	01-02-04-0164	Dr. Abol Munafi Ambok Bolong
7.	01-02-04-0162	Dr. Siti Aishah bt Abdullah
8.	01-02-04-0152	Dr. Siti Aishah bt Abdullah



Universiti Putra Malaysia

FAKULTI SAINS GUNAAN DAN TEKNOLOGI
(FACULTY OF APPLIED SCIENCE AND TECHNOLOGY)
UNIVERSITI PUTRA MALAYSIA TERENGGANU 21030 KUALA TERENGGANU, MALAYSIA
Tel: 09-6696411/412, 6693625/628-630/622 Fax: 09-6694660

Ruj. Kami (Our ref.) : P.man/prog/Q12001 (797)
Tarikh (Date) : 1 Jun , 2001

Sekretariat
Unit Penyelidikan UPM
Bahagian Canselori
Universiti Putra Malaysia
43400 UPM Serdang
Selangor

Tuan,

Daftar Progress Projek Penyelidikan IRPA Q12001 (Jan-Mac 2001)

Dengan segala hormatnya merujuk kepada perkara di atas.

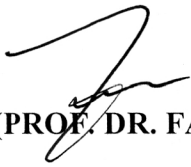
2. Bersama-sama ini disertakan dua salinan daftar progress projek penyelidikan IRPA Q12001 (Jan-Mac) Bagi projek "*The screening of bioactive compounds from marine algae and marine sponges for antimicrobial and antiparasitidals*" yang mengandungi :

1. Milestone Achievement Report
2. Project Activity Report
3. Financial Report

Sekian untuk makluman dan tindakan pihak tuan seterusnya.

Terima kasih.

Yang benar,


(PROF. DR. FAIZAH SHAHAROM)

s.k.

Sekretariat Penyelidikan UPMT

57505



Milestone Achievement Report

A. Project number: 01-02-04-0467	
Project title:	The screening of bioactive compounds from marine algae and marine sponges for antimicrobial and antiparasitids
Project leader:	Associate Professor Dr Faizah Shaharom
Tel:	09-6696411 ext 1083 Fax:09-6694660
B. Milestone achievement (Please attach the original project schedule from Section VI of the Application Form)	
Milestone name:	i. Collection of samples, ii. Samples extraction.
Planned milestone date:	i. Jan 2001, ii. Julai 2001
Achieved:	☐ i, ☒ Yes ☐ ii ☐ No (If no, please complete Sections C, D, E and F)
Milestone description (Please provide a short description of the milestone achieved)	
i.	Collection of sponge from Pulau Kapas, Pulau Redang, Pulau bidong and Pulau Perhentian has been done successfully.
ii.	Extraction of the samples is currently being carried out.
C. Reasons for non-achievement (Please give the reasons for non-achievement of the milestone)	
D. Suggested adjustments to the project approach (Please state the changes you propose)	
Adjustments to the Project schedule.	
E. Impact on project schedule (Please attach revised project schedule, if applicable)	
Revised date for this milestone:	November 2000
New date of project completion:	Mac 2002
Original date:	Dec 2000
F. Impact on project budget (Please attach revised project budget, if applicable)	
Original approved project budget:	RM 171,500
Revised project budget:	RM _____
Date:	6/5/01
Signature:	

Financial Report

A. Project number: 01-02 – 04-0467

Project title: The screening of bioactive compounds from marine algae and marine sponges for antimicrobial and antiparasitids

Project leader: Associate Prof Dr Faizah Shaharom

Tel:09-6696411 ext 1083

Fax:09-6694660

B. Actual Project Expenditure (Please report the expenditure for the past quarter)

Year: 2001

Quarter: ☒ Jan-Mar

☐ Apr-Jun

☐ Jul-Sep

☐ Oct-Dec

Project Cost Components	Actual Expenditure RM
• Salaried personnel (11100)	-
• Temporary and contract personnel (J 400)	1500.00
Sub-total staff costs	1500.00
• Travel and transportation (J 500)	-
• Rentals (J 600)	-
• Research materials and supplies (J 700)	1563.45
• Minor modifications and repairs (J 800)	-
• Special services (J 900)	-
• Special equipment and accessories (J 1000)	-
Sub-total direct expenses	1563.45
Total	3063.45

Is this performance in line with plan? ☒ Yes ☐ No (Please complete Sections C and D)

C. Reasons for variations from budget (Please provide the reasons)

D. Proposed corrective action (Please give details of the proposed action)

Date:

6/5/07

Signature:



Project Activity Report

A. Project Number: 01-02-04-0467

Project Title: The screening of bioactive compounds from marine algae and marine sponges for antimicrobial and antiparasitids

Project Leader: Associate Prof Dr Faizah Shaharom

B. Project Activity

Year: 2001 Quarter: X Jan-Mar Apr-Jun Jul-Sept Oct-Dec

Sponges from Pulau Redang have undergone preliminary identification process. The result of the identification and distributions of the sponge was highlighted as in the paper attached entitled "DISTRIBUTIONS OF SPONGES IN PULAU REDANG: A PRELIMINARY REPORT" which was presented in National Symposium on Marine Park and Islands of Terengganu; Towards Sustainable Usage and Management of Islands, 12 - 13 February 2001 at Grand Continental Hotel, Kuala Terengganu. For the samples of sponges from Pulau Kapas, fragmentation and isolation proses cannot be done in KUT because of lack of equipments, therefore the process will be carried out at the Institute Bioscience and in Animal tissue culture laboratory (ATCL2), Department of Biotechnology, Faculty Foods Science and Biotechnology, Universiti Putra Malaysia under the supervision of Associate Prof. Dr. Abd. Manaf Ali and Prof. Nordin Lajis.

C. Milestone achievement

Have you achieve any milestone?

 i Yes (Please attach the key Milestone Achievement Report form)

 No

	2000										2001										2002								
Research Activities	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M					
1. Literature review	→		▶																										
2. Collection of Samples (Sponge /Algae)		→	▶																										
i. Pulau Kapas																													
ii. Pulau Bidong			→	▶																									
iii. Pulau Redang			→	▶																									
iv. P. Perhentian				→	▶																								
3. Sample extraction <i>in vacuo</i>				—						●																			
4. Bioassay activity for determination of the bioactive compound				—											●														
5. Bioassay-guided Fractionation								—											●										
6. Identification of the bioactive compound													—											●					
7. Report writing																					—				●				

Revised Project Schedule

● Planned milestone

DISTRIBUTIONS OF SPONGES IN PULAU REDANG: A PRELIMINARY REPORT

J, Saidin.¹, F. M, Shaharom-Harrison.¹, A.M. Ali.²

¹Department of Science Biology
Faculty Science and Technology
Kolej Universiti Terengganu, UPMT
21030, Kuala Terengganu

²Department of Biotechnology
Faculty of Foods Science and Biotechnology
Universiti Putra Malaysia
43400, Serdang,
Selangor

Abstract: Thirty-one species were collected from eight stations from Pulau Redang Archipelago. Some have been preliminary identified as *Xetospongia exigna*, *Xetospongia testudinaria*, *Theonella* sp., *Agelas* sp., *Aximyca* sp., *Sigmaducia ambolnenuris*, *Aaptos* sp., *Ircinia* sp, *Dysedia* sp. and *Plakinalopha resirabillis*.

Keywords: Pulau Redang, Sponges, Database

INTRODUCTION

Sponge is a simple sessile marine animal under phylum porifera and characterized with having cellular-level organization and possesses a unique feeding system (Hooper, 2000). About 7,000 species have been documented and believed to exceed 15,000 living species available worldwide. In Indo-Malay Archipelago and South China Sea may contain a very high diversity, about 4000-6000 species and only 1200 species were documented (Hooper, 2000).

Sponges have no significant effect to the economy, but it is one of a very important resource for scientific studies. Previously researcher reported that a sponge possesses unique and complex chemical structure compared to terrestrial inhabitants (Hooper, 2000; Ailello and Menna, 1999; Muller et al., 1999; Johnson et al., 1999). Hundreds of chemicals have been isolated each year and most proved to be novel chemicals and biologically active (Appendix 1). The chemicals were tested for antibacterial, antifungal, cytotoxic activity against cancer cells, anti proliferation for HIV virus, inhibitor for histamine release and as antioxidant. Marine bacterial and fungal also have been isolated from sponges and these microorganisms were found to synthesize bioactive chemicals. All these test are significantly important to fulfill the urgency and to cope with seriousness of medical problem today. Some researcher was studied sponges as pollution indicator especially for heavy metal pollution.

Therefore to ensure availability and a manageable later-on references of sponges in Pulau Redang archipelago for scientific studies resource, the objectives of this study are:

1. To build preliminary databases of sponges available in Pulau Redang.
2. To make a comparison of sponges in Pulau Kapas, Pulau Bidong, Pulau Redang and Pulau Perhentian.

Materials and Methods

Sponges collections: Sponges were collected from Pulau Redang. The characteristic of sponges such as shape, size, colour and surface ornamentation were recorded *in-situ*. The samples were immediately kept in ice and transferred to -20°C. The sponges were preserved in 95% methanol (Hooper, 2000) for the identification process.

Identification process: Preliminary identification was done via comparing collected sample with the photographs from references. The major characteristic used to identify sponges are as described by Hooper, 2000:

- 1) Histological
 - a) Spicules, a discrete element of the skeletons usually mineralised (silica or calcite), produced by sclerocytes. This process is to determine the diversity and geometry of the spicules.
 - b) Perpendicular section through sponge tissue and viewed under dissecting microscope or light microscope to see the structure of the skeleton and water-canal system.
- 2) Shape.

Generally species growth form can be defined with reasonable limits, used with certain degree of caution, shape may be informative for particular species recognitions. The range of shape seen in sponges is enormous, extending from thin encrustation to massive volcano shape, finger-like or whip-shape, 'golf-ball', fan and etc.
- 3) Size.

The size to which particular specimens may grow may be influenced by several factors, such as individual age, the prevailing environmental condition (current, sedimentation, light, etc.) and also species particular genetic characteristic. Some species is capable to growing to very huge volcano shape (e.g. *Xetospongia*) or merely thinly encrusting on dead coral (e.g. *Petrosia*).
- 4) Colour.

Certain group of sponges (such as *Verongida* and *Aaptos*), have peculiar pigments that darken upon contact with air, others (such as Mycalidae and Tedaniidea, order poecilosclerida) produce pigments mucus that stain or irritates human skin. The range of sponge's pigments is enormous, varying from drab, colourless form (black, beige or white) to very colourful species (vibrant reds, greens, yellows, and blues).
- 5) Texture.

A sponge which rubbery, compressible but difficult to tear or cut may contain no or few spicules but well developed sponging fiber system (e.g. *Ircina*); a sponge that is soft, friable and easily torn probably has both fibers and spicules reduced (e.g. *Haliclona*); one that has a hard, stony but easily crumpled may lack sponging fibre and have a closely compacted spicules skeleton (e.g. *Petrosia*); sponges incorporating sand into skeleton are also to large extent brittle, easily crumbled and incompressible (e.g. *Chondropsis*); sponges that are hard, incompressible, difficult to cut or break may lack of sponging fiber but have interlocking spicules, and/or a dense surface crust of spicules (e.g. *Desmathus* and *Geodia*).

6) Surface ornamental.

The presence and distribution of the surface pores, ridges, microconules, stalks, digits, protruding spicules and other, are often important descriptive characters, and sometimes useful features in recognizing particular genera.

Results and Discussions

Sampling Point	Depth (meters)	Sponges Collected
St 1: N 05°44'478, E 102°59'994	5.0	7
St 2: N 05°45'525, E 103°01'759	9.8	4
St 3: N 05°46'372, E 103°03'534	9.0	4
St 4: N 05°44'298, E 103°01'755	5.6	4
St 5: N 05°48'889, E 103°00'575	7.0	11
St 6: N 05°47'987, E 103°01'063	6.0	6
St 7: N 05°44'164, E 103°01'162	10.0	8
St 8: N 05°43'918, E 102°59'848	9.0	10
Total No. of Sponges Collected		54

Table 1: Summary of Sponges Collected from Pulau Redang.

Island	No of Species
Pulau Kapas	14
Pulau Bidong	31
Pulau Redang	31
Pulau Perhentian	26

Table 2: Comparison of number of Sponge species available from four Terengganu Islands.

There were 54 samples collected, consisting of 31 species from Pulau Redang (Table 1). Nine species were preliminary identified as *Xetospongia exigna*, *Xetospongia testudinaria*, *Theonella* sp., *Agelas* sp., *Aximyca* sp., *Sigmatucia ambolnenuris*, *Aaptos* sp., *Dysedia* sp. and *Plakinalopha resirabillis* (The preliminary identification were done based on the comparison of photographs to the books elaborated by T.M. Gosliner, D. W. Behrens and G. C. Williams [Coral Reef Animals of the Indo-Pacific, Sea Challengers, Monterey, 1996]). The identified species were from class Demospongia which exhibit 95% of sponge living species. John N. A. Hooper, 2000, described this species in 'Sponguide' Guide to Sponge Collection and Identification as "Sponges with the skeleton composed of spongin fibres alone or together with siliceous spicule (although some "relict sclerosponge" form have both a basal calcitic skeleton as well as free siliceous spicules). Some groups lack mineral skeleton entirely. Collagenous filaments or fibrils (forming the ground substance of the intercellular mesohyl) are ubiquitous, spongin fibres (also composed collagen) occur in most families, and histological organisation is always cellular. Choanocytes occupy chambers that are spherical, hemispherical, elongated or branched".

In comparison, Pulau Redang and Pulau Bidong have higher number of species both with 31 species compared to Pulau Perhentian and Pulau Kapas with 26 and 14 species respectively (Table 2). Generally sponges in the four islands were from the same species except for *Paratetilla* sp. can be found at Pulau Kapas, *Callyspongia* sp., Unknown 1 and unknown 2 which can be found at Pulau Bidong. A few species which were specifically found at certain island and studies on these species are in progress.

CONCLUSIONS

Pulau Redang and Pulau Bidong have higher number of species both with 31 species. The identified species are from class Demospongia, they are *Xetospongia exigna*, *Xetospongia testudinaria*, *Theonella* sp., *Agelas* sp., *Aximyca* sp., *Sigmatucia ambolnenuris*, *Aaptos* sp., *Dysedia* sp. and *Plakinalopha resirabillis*.



Figure 1. Barrel sponge, *Xestospongia testudinaria*. *Xestospongia testudinaria*, (barrel sponges, Figure 1) has a remarkable feature. This species can easily identified by huge barrel shape characteristic. This species and *Aaptos sp* (Figure 3) can be found abundantly in Pulau Redang, Pulau Bidong, Pulau Kapas and Pulau Perhentian. .

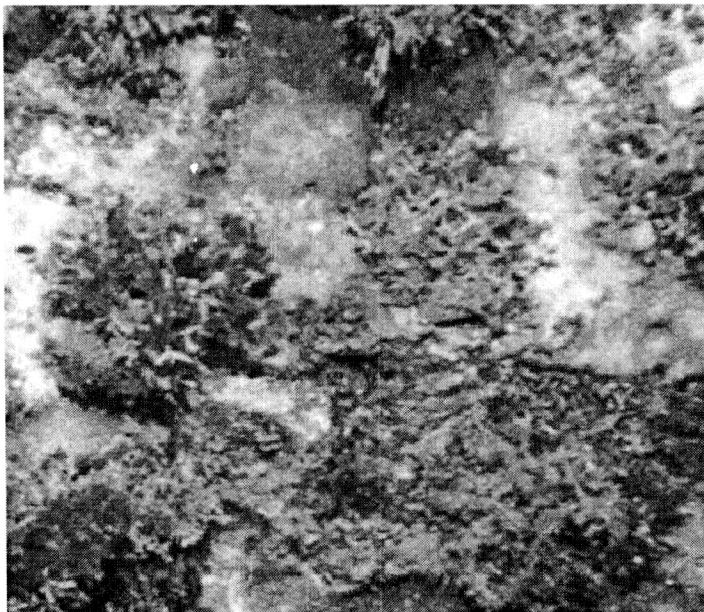


Figure 2: *Stellitonopsis sp.*

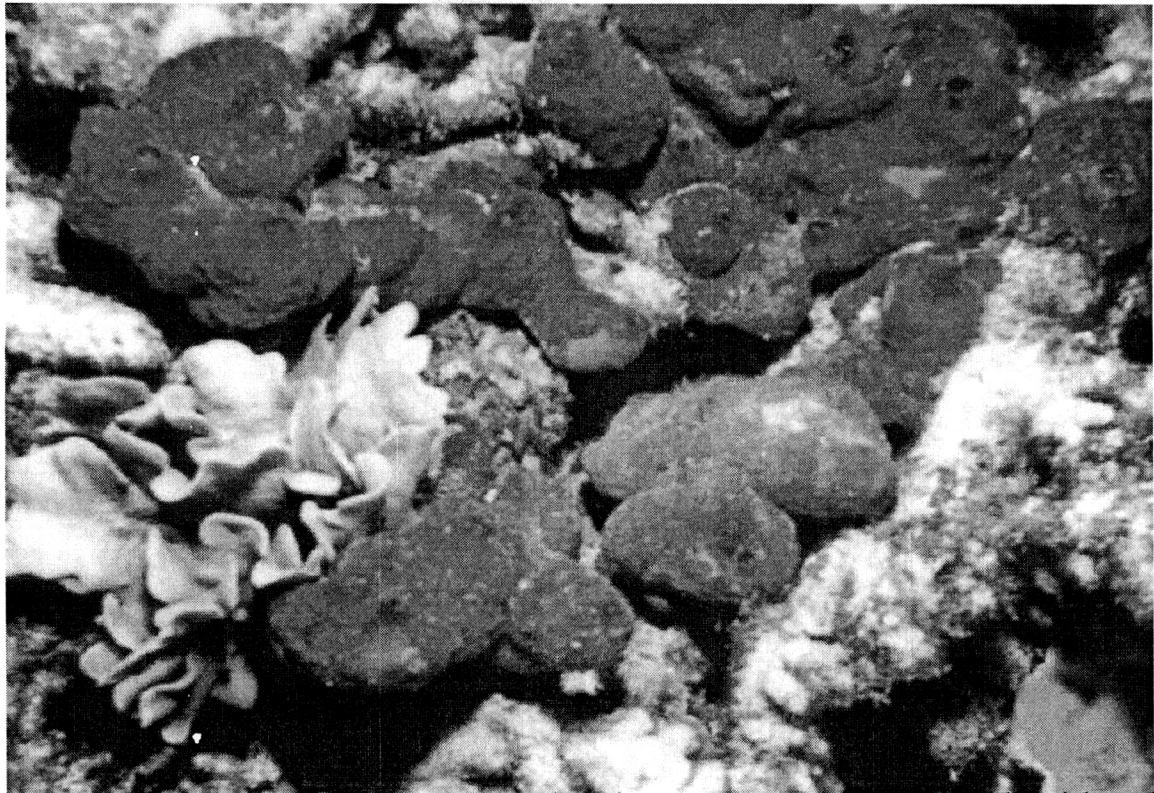


Figure 3: *Aaptos sp.*, this species have distinctive outer colour brown to yellowish and yellow for the inner colour .



Figure 4: This sponges have blue i colour are *Sigmadocia ambolnenuris* which can be found at all stations i Pulau Redang and abundantly a station 5.

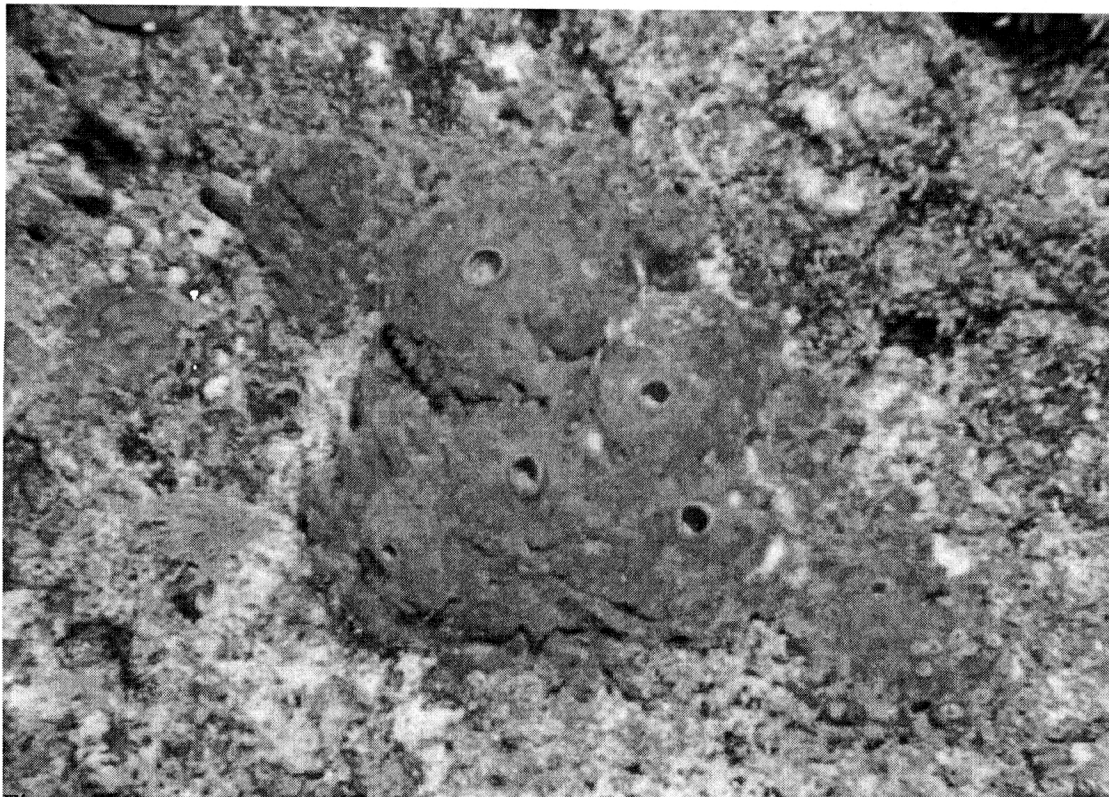


Figure 4: *Theonella* sp.,

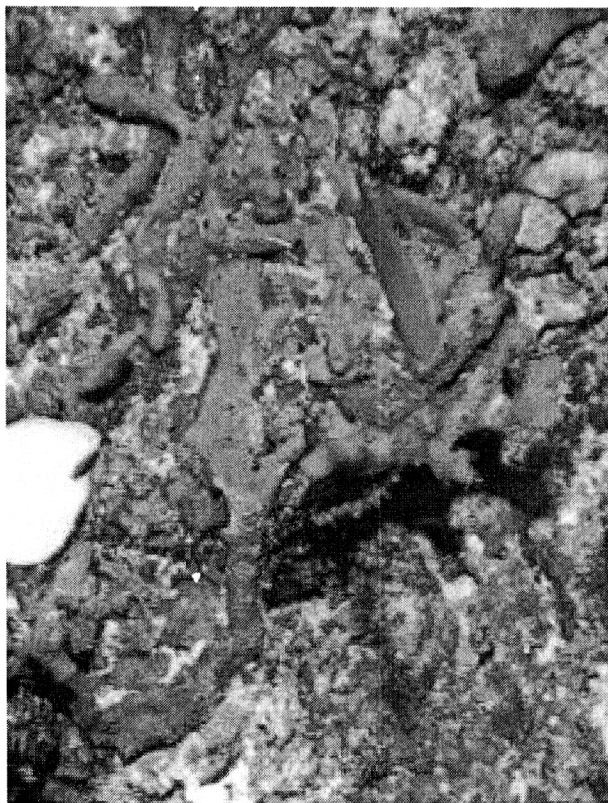


Figure 5: *Ircinia* sp., this sponge is characterized with rubbery texture compressible and very difficult to cut or tear.

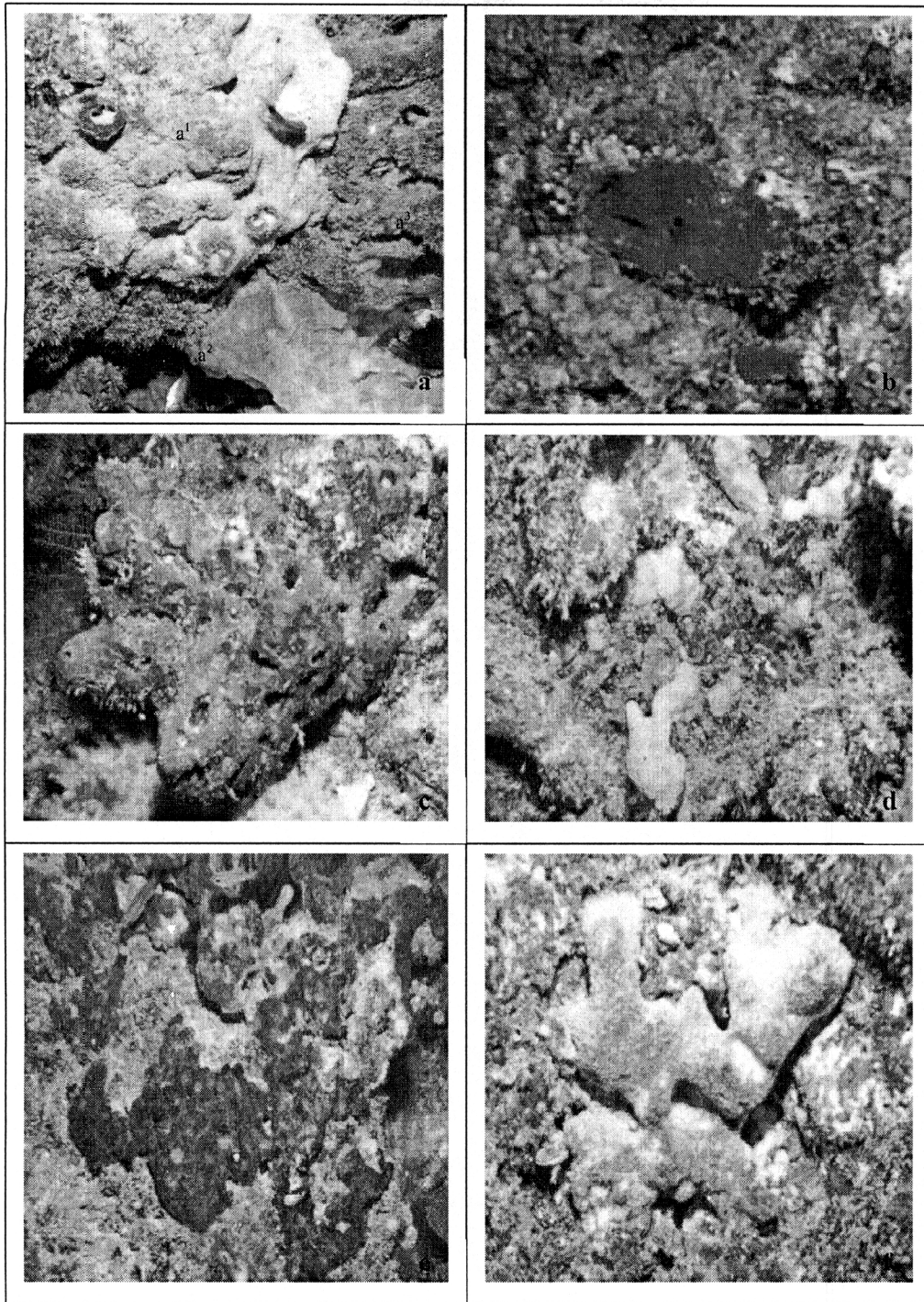


Figure 6: The unidentified sponges from Pulau Redang, In the picture (a) we can see three different species of sponges (a¹, a² and a³) are incorporated together.



KOLEJ UNIVERSITI TERENGGANU

FAKULTI SAINS DAN TEKNOLOGI
(FACULTY OF SCIENCE AND TECHNOLOGY)
UNIVERSITI PUTRA MALAYSIA TERENGGANU 21030 KUALA TERENGGANU, MALAYSIA
Tel: 09-6696411/412, 6693625/628-630/622 Fax: 09-6694660



Ruj. Kami (Our ref.) : KUT / FST / TD (PPS) / 2-2/2/1 (78)
Tarikh (Date) : 16 Mac, 2001

Sekretariat
Unit Penyelidikan UPM
Bahagian Canselori
Universiti Putra Malaysia
43400 UPM Serdang
Selangor

Tuan,

Daftar Progress Projek Penyelidikan IRPA Q12001(Jan-Mac. 2001)

Dengan segala hormatnya merujuk kepada perkara di atas.

2. Disini disertakan daftar progress projek penyelidikan IRPA Bagi projek "*In-vitro* cultivation of fish blood parasites and development of microsatellite markers" yang mengandungi :

1. Milestone Achievement Report
2. Project Activity Report
3. Financial Report

Sekian untuk makluman dan tindakan pihak tuan seterusnya.

Terima kasih.

Yang benar,

(PROF. DR. FAIZAH SHAHAROM)

s.k.

Sekretariat Penyelidikan UPMT

Milestone Achievement Report (Q12001)

A. Project number: 01-02-04-0468	
Project title:	<i>In-vitro</i> cultivation of fish blood parasites and development of microsatellite markers
Project leader:	Associate Professor Dr Faizah Shaharom
Tel:	09-6683243
Fax:	09-6694660
B. Milestone achievement (Please attach the original project schedule from Section VI of the Application Form)	
Milestone name:	i) In vitro morphological development ii) In vivo study in leeches iii) Development of microsatellite marker
Planned milestone date:	April 2001
Achieved:	☒ i) Yes ☒ ii, iii) No (If no, please complete Sections C, D, E and F)
Milestone description (Please provide a short description of the milestone achieved)	
i) Morphological studies of In vitro and in vivo of <i>Trypanosoma sp.</i> ii) Develop techniques for genomic studies of <i>Trypanosoma sp.</i> from blood of eel. iii) To study the relation ship of <i>Trypanosoma sp.</i> isolated from different area eel.	
C. Reasons for non-achievement (Please give the reasons for non-achievement of the milestone)	
i) In vivo study could not be done because there was problem to get new hatch leech that was needed to be used in the study. Experiment to propagate the leeches failed. ii) The development of microsatellite was changed to RAPD fingerprinting which easier and cheaper	
D. Suggested adjustments to the project approach (Please state the changes you propose)	
i) The in vivo morphological forms in vector is mostly similar to in vitro. ii) The genomic studies of the <i>Trypanosoma sp.</i> was changed from development of microsatellite marker to PCR- RAPD fingerprinting technique. This experiment is still in progress.	
E. Impact on project schedule (Please attach revised project schedule, if applicable)	
The objective of the project to study the stages morphological form and genomic comparison will still be achieved. These changed won't effect the project schedule.	
Revised date for this milestone:	i) Mac 2001 ii) Jan 2001
New date of project completion:	Sept 2001
Original date:	November 2000
F. Impact on project budget (Please attach revised project budget, if applicable)	
Original approved project budget:	RM 145,900
Revised project budget:	RM _____
Date:	25/4/2001
Signature:	

Financial Report (Q12001)

A. Project number: 01-02 -03-0456

Project title: *In-vitro* cultivation of fish blood parasites and development of microsatellite markers

Project leader: Associate Prof Dr Faizah Shaharom

Tel:09-6683243

Fax:09-6694660

B. Actual Project Expenditure (Please report the expenditure for the past quarter)

Year: 2001

Quarter: ☒ Jan-Mar

☐ Apr-Jun

☐ Jul-Sep

☐ Oct-Dec

Project Cost Components	Actual Expenditure RM
• Salaried personnel (11100)	-
• Temporary and contract personnel (J 400)	1500.00
Sub-total staff costs	1500.00
• Travel and transportation (J 500)	-
• Rentals (J 600)	-
• Research materials and supplies (J 700)	7230.75
• Minor modifications and repairs (J 800)	-
• Special services (J 900)	-
• Special equipment and accessories (J 1000)	-
Sub-total direct expenses	7230.75
Total	8730.75

Is this performance in line with plan? ☒ Yes ☐ No (Please complete Sections C and D)

C. Reasons for variations from budget (Please provide the reasons)

D. Proposed corrective action (Please give details of the proposed action)

Date:

29/4/2001

Signature:



Project Activity Report (Q12001)

A. Project Number: 01-02-03-0456

Project Title: *In-vitro* cultivation of fish blood parasites and development of microsatellite markers

Project Leader: Associate Prof Dr Faizah Shaharom

B. Project Activity

Year: 2001 Quarter: ~~X~~ Jan-Mar ___ Apr-Jun ___ Jul-Sept ___ Oct-Dec

In vitro cultivation and stage morphological studies
(Please refer appendix 1 & 2)

Summary

Studies of In vitro stage development has been done successfully. The morphological changes in vitro have been recorded via image analysis system and redrawn in tracing paper to give better explanation. (Appendix 1)

A paper on In vitro cultivation has been published at Monash University for Biotechnology Symposium 2001. (Please refer appendix 2)

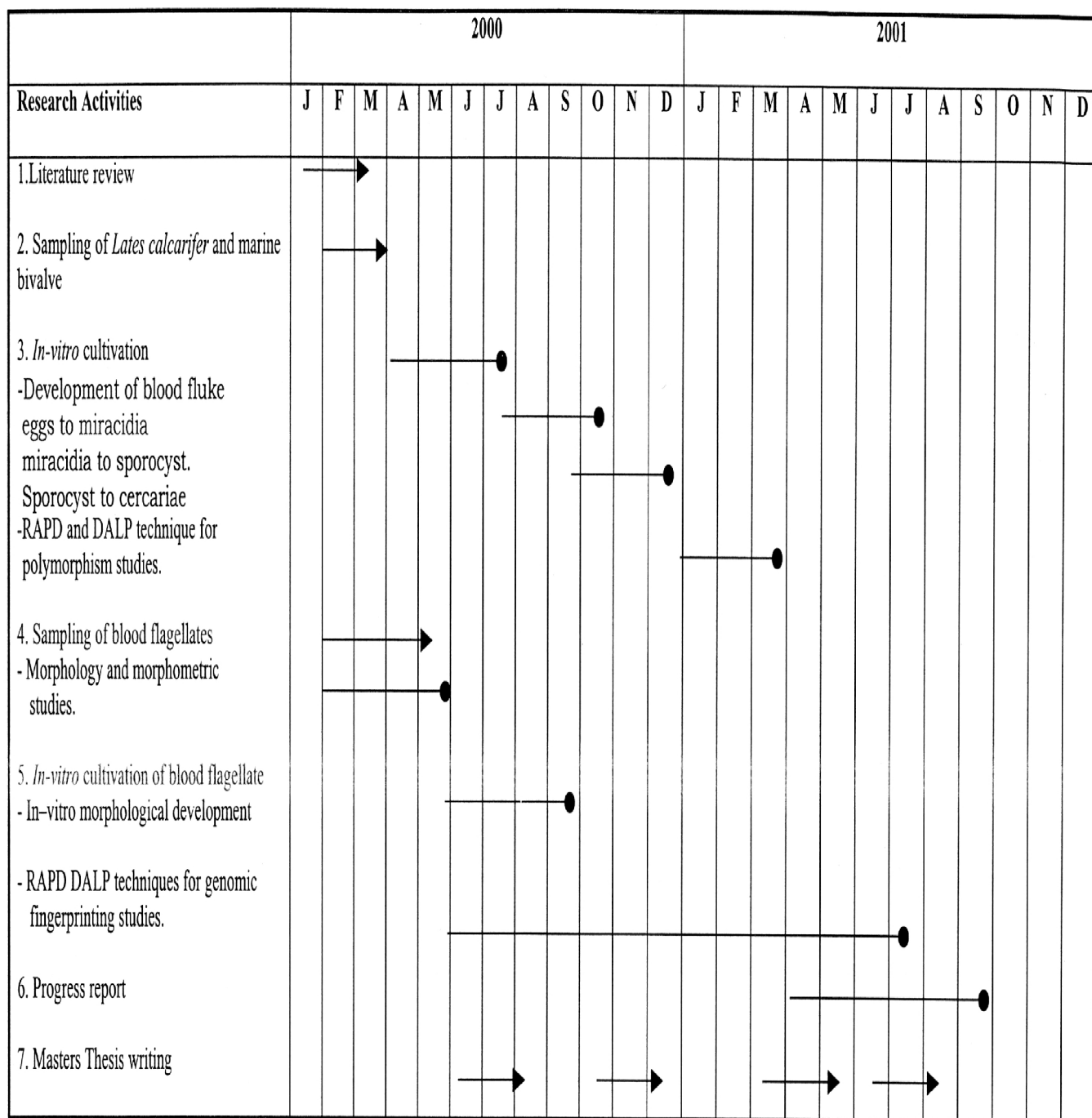
C. Milestone achievement

Have you achieved any milestone?

i Yes (Please attach the key Milestone Achievement Report form)

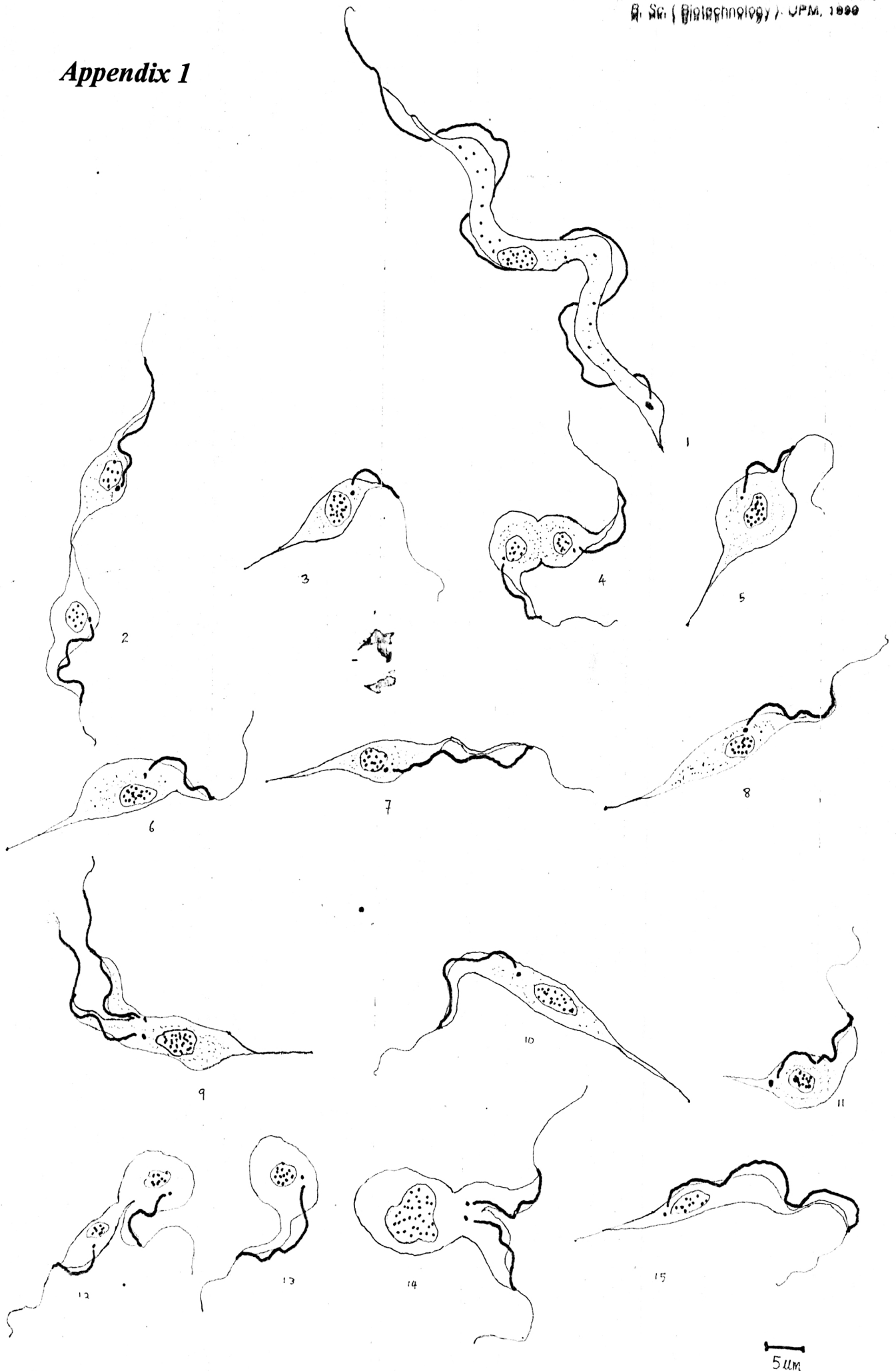
ii, iii No

Revised Project Schedule

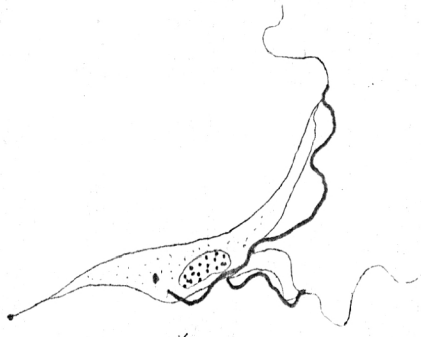


● Milestone →

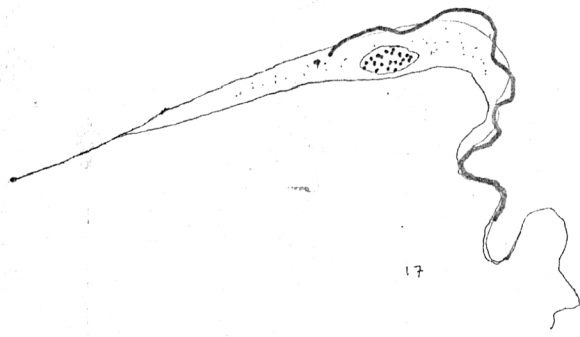
Appendix 1



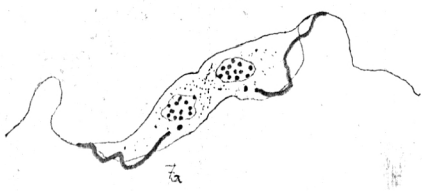
5 μ m



16



17



18

***In vitro* cultivation of *Trypanosoma* sp. (Protozoa:kinetoplastida) of eel, *Monopterus albus* using diphasic define medium.**

Rustan E.Ismail¹, Faizah Shaharom-Harrisson¹, A.M Ali² A.M Samad¹

¹Department of Biology, Fac. Sc. & Tech.

University College Terengganu, Malaysia.

²Department of Biotechnology, Fac. Food Sc. & Biotech.

Universiti Putra Malaysia

ABSTRACT

Trypanosoma sp. from eel's bloodstream were cultivated *in vitro* at 28 °C - 30 °C in diphasic define medium of blood bacto agar (BBA) and liquid of basal medium Eagle (BME) and RPMI 1640 medium. The blood bacto agars were treated with different sources of heat-inactivated bloods of eel (HIEB) and rabbit (HIRB). In medium with BME liquid phase, maximum growth of trypanosomes was isolated at 176 hrs with number of flagellate being $1216.5 \pm 18.482 \times 10^4$ flagellates/ml (n=4) for HIRB and $940.25 \pm 7.89 \times 10^4$ flagellates/ml (n=4) for HIEB. Growth in medium with RPMI 1640 was lower. Flagellates isolated were $427 \pm 16.75 \times 10^4$ flagellates/ml at 176 hrs, and $329.25 \pm 11.62 \times 10^4$ flagellates/ml at 148 hrs (n=4) for HIRB and HIEB respectively.

Flagellates from medium with BME/BBA(HIRB) was sub-cultured at Day 4 post inoculation in same fresh medium, and the growth increased until 3 days after subculture with maximum number $850.9 \pm 8.62 \times 10^4$ flagellates/ml.

Key words: *Trypanosoma* sp., blood flagellate, swamp eel, *Monopterus albus*, *in vitro*.

INTRODUCTION

Trypanosoma sp. tends to occur in bloodstream of local eel, *Monopterus albus* or locally called 'belut' which is one of popular fish as food in Malaysia. The *Trypanosoma* sp. was reported infecting the fish with prevalence 8% in Perak, 60.8% in Terengganu and 60 % in Kelantan (Jili et al, 1999). Little is known about the taxonomy, morphology and life cycle of the species. *In vitro* cultivation of the haemoflagellate will hopefully lead a route for further study on the species; identification of the species, stage development morphology, life cycle and even etiology. The aim of the present study was to get the optimum medium for primary culture of the *Trypanosoma* sp. from bloodstream of eel.

MATERIALS AND METHODS

Collection and examination of fish

Eels were obtained from the market, which were collected from swamp and paddy field in Kuala Terengganu area. Blood was collected in 23_G x 1" U.T.W 5ml heparinise syringe from caudal vein and examined for flagellates using the hematocrit centrifugation technique(HCT; WOO, 1969a).

Culture media

50% Dilution of Eagle's basal medium (BME, Hank's salt and L glutamine; Gibco Laboratory) were each supplemented with heat inactivated bovine serum (BS), prepare fresh from bovine age 3-4 years, 2.5% (v,v) and buffered with 25mm HEPES (pH 7.3). Antibiotic-antimycotic(GibcoBRL, Cat. no: 15240-062) were added. Second medium was 50% dilution of RPMI 1640 medium and supplemented with the same components as in BME.

Blood agar medium was prepared from Bactor starch agar 20g/l, (Gibco) and 30% (v,v) heat inactivated eel (HIEB) and rabbit (HIRB) blood. These media were prepared as slant diphasic medium (50%:50%(v:v)) and designated BME/HIEB, BME/HIRB, BPM/HIEB and RPM/HIRB respectively.

Culture of *Trypanosoma* sp. from blood of eel

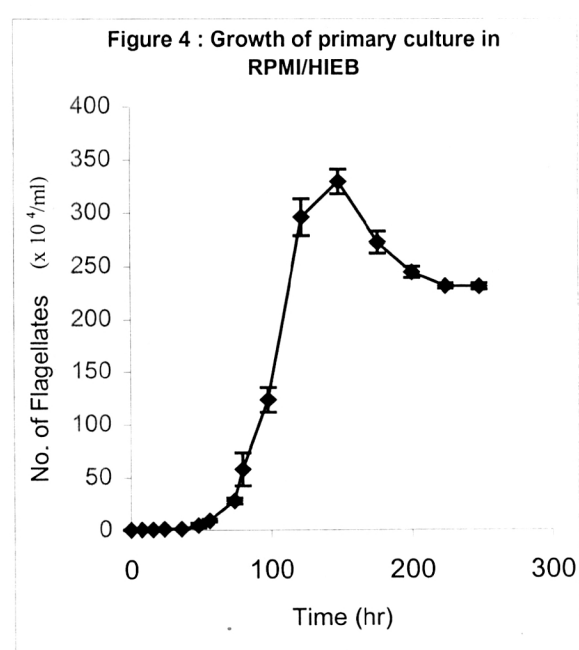
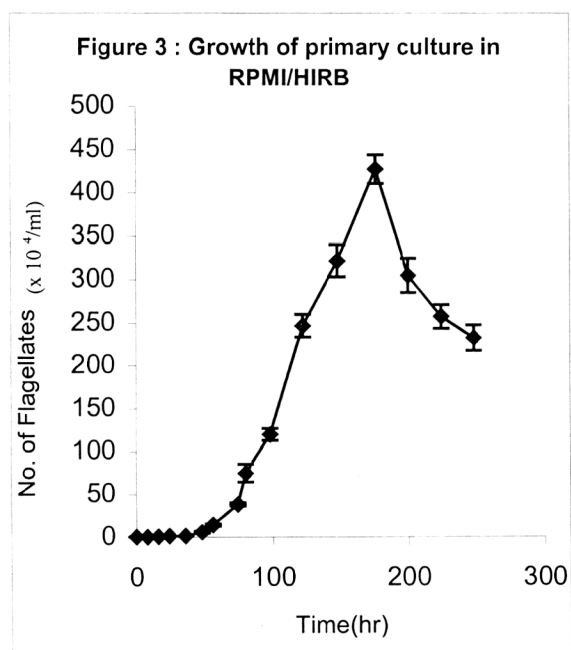
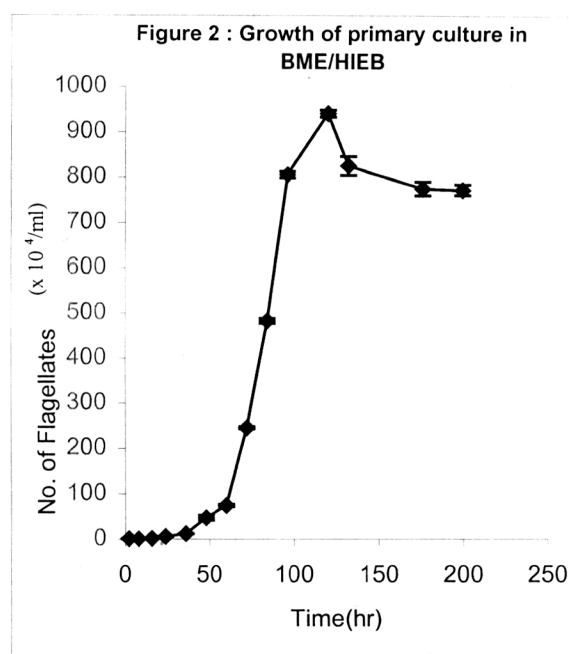
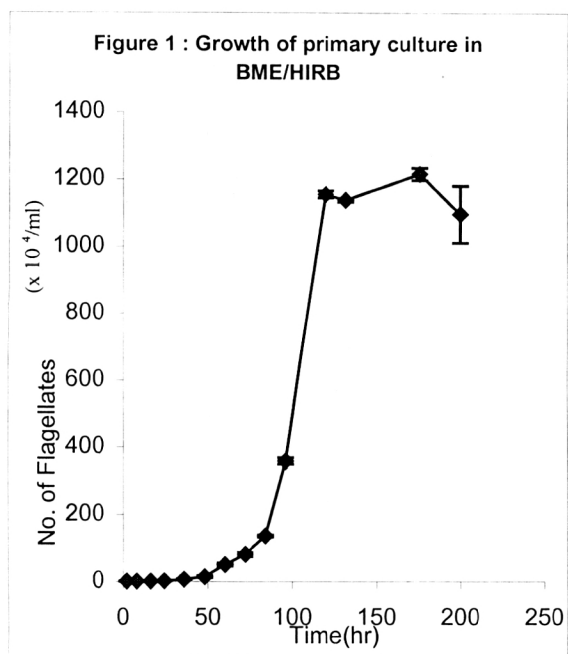
200 µl of infected blood was inoculated into media (5ml liquid phase). Cultures were maintained at 28 -30 °C in the dark in incubator and subcultured into fresh BME/HIRB medium. Growth of flagellates were enumerated using haemocytometer. Observation was done by DMR Leica microscope and specimen was stained by Giemsa.

RESULT

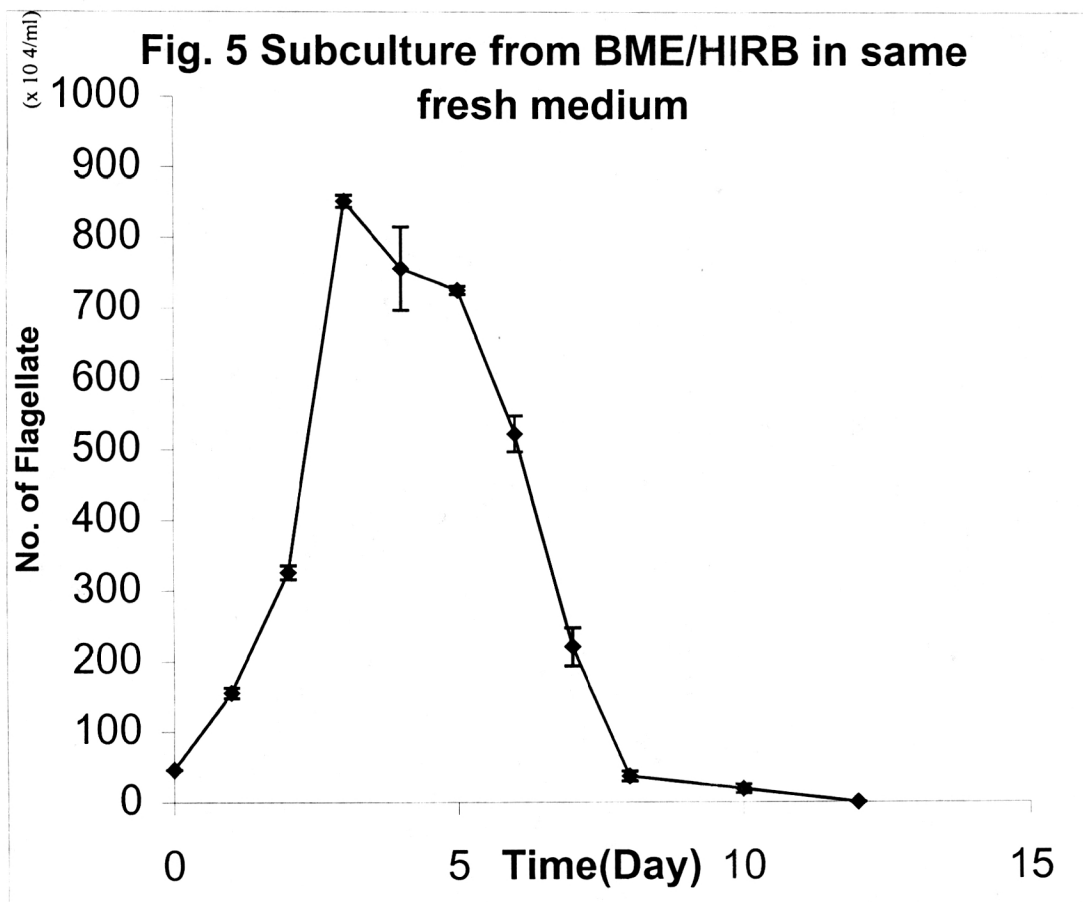
Growth

Growth occurred in all designated media BME/HIRB, BME/HIEB, RPMI/HIRB and RPMI/HIEB with maximum growth $1155.75 \pm 10.72 \times 10^4$ flagellates/ml, $940.25 \pm 7.89 \times 10^4$ flagellates/ml, $427.5 \pm 16.76 \times 10^4$ flagellates/ml and $329.25 \pm 11.62 \times 10^4$ flagellates/ml (n=4 for every media) respectively. Growth profile showed the same pattern in all those media where the growth increased exponentially and decreased after maximum point and resulted in a sigmoid curve (Figure 1 to 4).

The growth was related to forms present in culture. During early phase (lag phase) the trypanosome seem to start dividing by multiple and binary division to small stumpy epimastigote (Plate 1). At exponential phase to maximum point, stumpy epimastigote (Plate 2), long and slender epimastigote (Plate 3) form was present. Maximum point was reached at the time when long and slender epimastigote forms were dominant in the culture. Decreasing started to occur when round form (Plate 4) and trypomastigote (Plate 5) appeared. Observations were done until no flagellate were present in culture. Media pH decreased from before inoculation 7.35 ± 0.01 until the last day of observation 6.4 ± 0.5 .



(Figure 1-4, Y values are Mean $\pm$ Standard deviation, n=4 for every point)



(Figure 5, Y values are Mean $\pm$ Standard deviation, n =4 for every point)

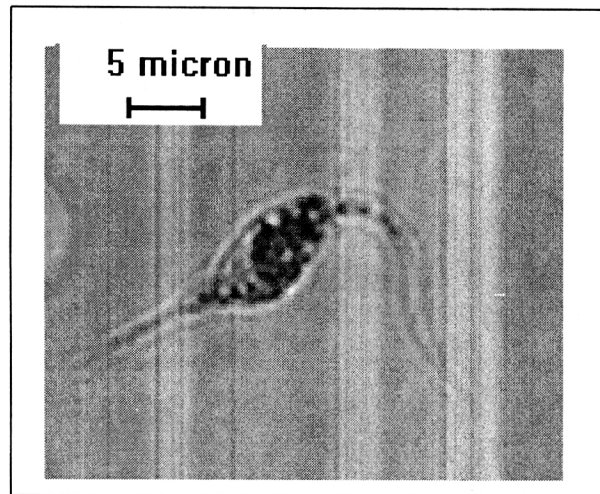


Plate 1 : Small stumpy form

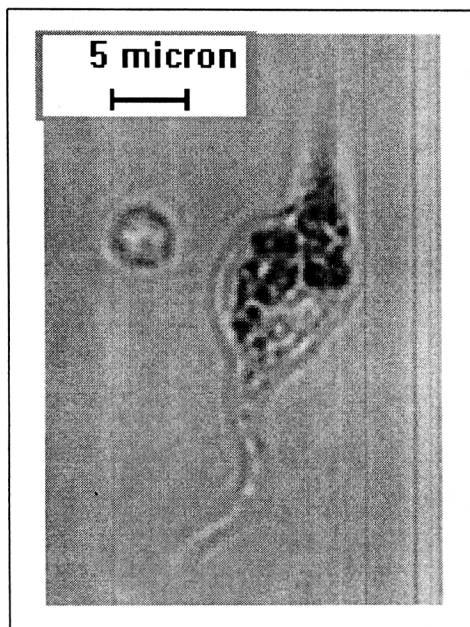


Plate 2: Big stumpy form

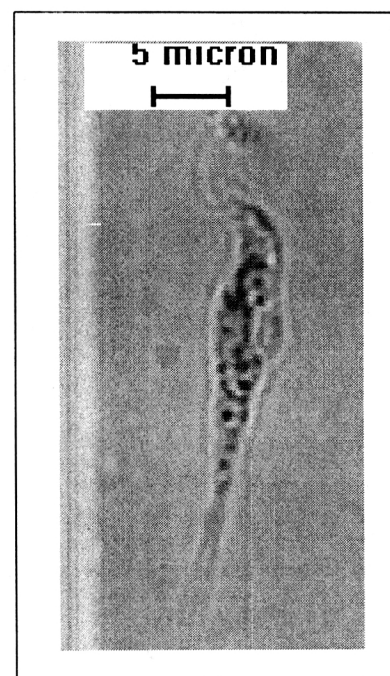


Plate 3 : Long and slender form

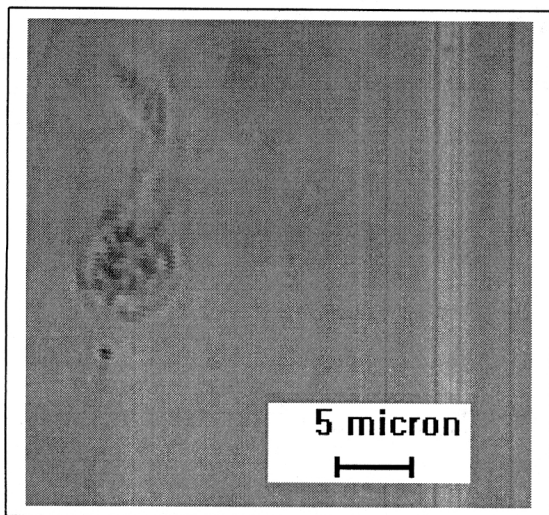


Plate 4 : Rounding form with posterior tip

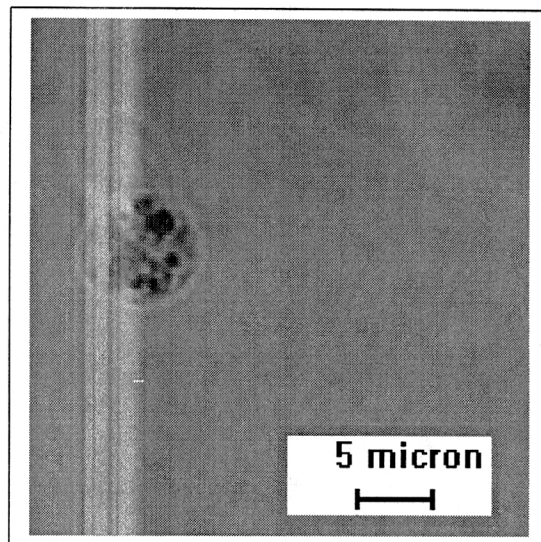


Plate 5 : Rounding form without posterior tip

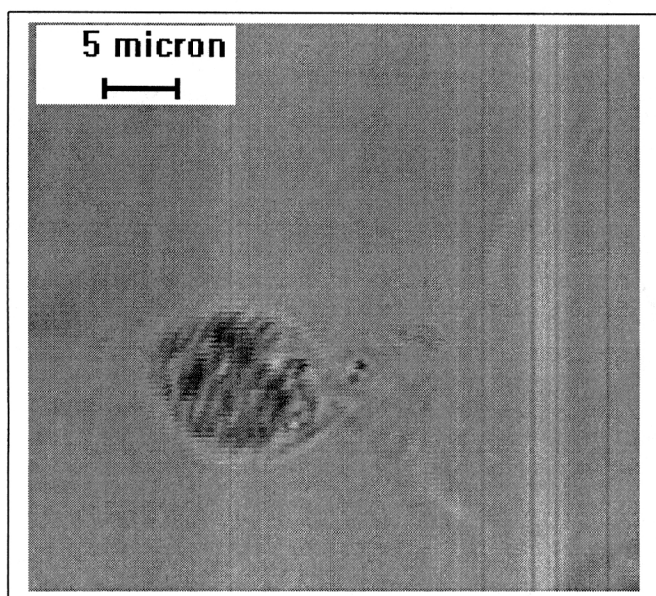


Plate 6 : Division of rounding form to produce trypomastigote

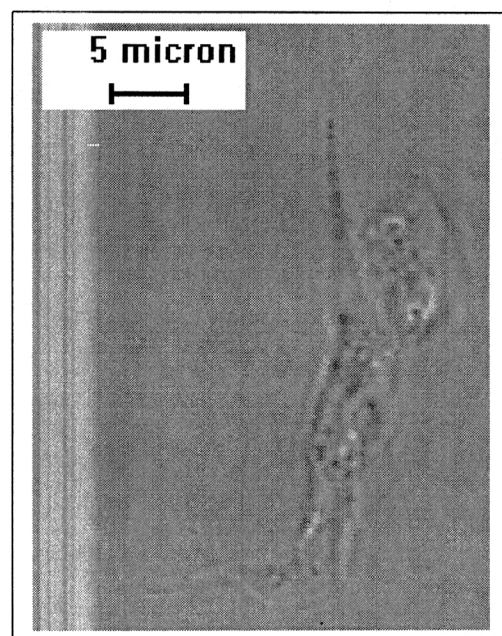


Plate 7 : Metacyclic trypomastigote form

(continue Result)

Subculture was done from BME/HIRB medium in same fresh medium at day 4 post inoculation (p.i). 200 μ l of $1155.75 \pm 10.72 \times 10^4$ flagellates/ml from BME/HIRB medium was inoculated into 5ml fresh medium made inoculation size was 46.23×10^4 flagellates/ml. Growth in subculture medium was increased until day 3 post subculture (p.s) and decreased after that. As in primary culture in BME/HIRB at day 4 p.i the dominant form was long and slender epimastigote so the inoculation form started with this form and continually developed. A round form was present at day 1 p.s but long and slender form still dominant until day 3 p.s. At day 4 epimastigote, round form and small number of trypomastigote were seen. This mix forms continued until day 8-10 p.s. During this period decreasing of epimastigote form resulted increasing of rounding form and trypomastigote form. At day 10 p.s, dead flagellates were seen and some were in very weak motion. No flagellate were present at day 12 p.s and pH of the media was also decrease from 7.35 to 6.45.

Division

Division was by equal or unequal binary fission that produce two epimastigote or epimastogote and round form respectively. Two round forms were produced by equal or unequal binary fission. The round form matured and divided to produce bigger round form without tip at posterior (plate 5). This bigger round form divided to trypomastigote (Plate 6) and another round form or both trypomastigote(plate 7). Mechanism of this transformation was not so clear. The observation only proved the trypomastigote was produced from round form.

DISCUSSION AND CONCLUSION

Growth was different in all designated media. BME based medium gave better growth compared to RPMI, and HIRB was better than HIEB. BME was used ordinarily in growing *Trypanosoma* sp. in-vitro. SRM Jones and PTK Woo(1991), also used BME in growing *T. catostomi* and *T. phaleri*. Blood source also influence the growth. According to Fig 1-4, growth in HIEB was faster where the curve gradient (dx/dt , where x is no. flagellate and t is time) was higher than in HIRB. However, maximum growth was obtained in HIRB medium. HIRB are clearly superior to HIEB which has been so far used for cultivation of trypanosome.

The growth profile was sigmoid. After reaching maximum point the growth decreased. So many factor may caused the decrease, such as substrate limitation, space limitation or accumulation of inhibitory product (P.F stanbury & A Whitaker, 1984). During decline phase forms present (round form and trypomastigote) in culture was same in all treatment although at different time. This also occurred in subculture medium. In primary culture of BME/HIRB the curve fell after reached maximum point which also resulted the decreasing of epimastigote form, but subculture which done at maximum point showed the epimastigote still able to increase and reach maximum point again. Sigmoid growth profile pattern also happened in culture of *T. danilewskyi*(R. Wang & M. Belosevic,1994), *T. catostomi* and *T. phaleri*(S.R.M Jones & P.T.K Woo,1991) and *T. brucei*, *T. rhodensiense*, and *T. gambiense*(Brun et al., 1981).

Transformation to different form related to the change of media composition along the incubation. Epimastigote started to transform into round form and trypomastigote after reached maximum point but formation of round form and trypomastigote did not occur when medium was replaced with fresh medium during subculture. In subculture round form and trypomastigote only presented in high number after the epimastigote reached maximum number again. The change of medium composition was detected when media pH changed during cultivation, which showed the present of certain product such as ammonia, enzymes or any metabolite solution in the culture media(P.F stanbury & A. Whitaker, 1984).

Growth also related to forms which presented in culture. Growth was very weak at lag phase, which the blood stream form started to divide. High growth was obtained at exponential phase where epimastigote was dominant. Growth fell during round and trypomastigote form.

Division occurred by binary or multiple fission. Normally multiple fission only occurred at begining of cultivation which first division of blood stream form started to develop. Epimastigote always divided by binary fission but with equal and unequal fission which resulted different form produced. The first indication of binary fission in epimastigote was the production of new flagellum (Plate 6), this was followed by divission of kinetoplast, nucleus and cytoplasm(S.R.M Jones & P.T.K Woo,1991).

References

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- Woo, P.T.K (1969a). The hematocrit centrifuge for the detection of trypanosomes. *Canadian Journal of Zoology* 47, 921-3

References

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- S.R.M Jones and P.T.K Woo.1991. Culture Characteristic of *Trypanosoma catostomi* and *Trypanosoma phaleri* from North American freshwater fishes. *Parasitology* (1991) 103. 237-243.
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- A.E.R Taylor and J.R Baker. 1987. In vitro Methods for parasite cultivation.Academic Press, 1987. pp 77-86
- P.F Stanbury and A. Whitaker.1984.Principles of Fermentation Technology. *Pergamon Press*, 1984. pp11- 24
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UNIVERSITI PUTRA MALAYSIA

Fakulti Sains dan Teknologi
(Faculty Science and Technology)

7

Ruj. Kami (Our ref.) : KUT/FST/TD (PPS)/2-2/2/1 (75)
Tarikh (Date) : 26hb. April 2001

En. Mohd Izham bin Ismail
Ketua
Unit Penyelidikan Canseleri
Universiti Putra Malaysia
43400 UPM Serdang
Selangor Darul Ehsan

Tuan,

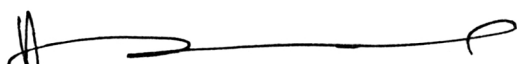
DAFTAR PROGRES PENYELIDIKAN IRPA Q12001 (JAN – MAC 2001)

Dengan segala hormatnya saya merujuk kepada perkara yang tersebut di atas.

Sukacita bersama-sama ini disertakan daftar progres penyelidikan IRPA (Jan – Mac 2001) bagi pensyarah yang berkenaan untuk makluman dan tindakan pihak tuan seterusnya.

Sekian, terima kasih.

Saya yang menjalankan tugas,


(PROF. DR. HAMDAN SUHAIMI)

Timbalan Dekan
Penyelidikan dan Siswazah

s.k - Fail Edaran



KOLEJ UNIVERSITI TERENGGANU

UNIVERSITI PUTRA MALAYSIA

Institut Oseanografi

Rujukan Kami :

Rujukan Tuan :

Tarikh : 23 April 2001

Sekretariat
Unit Penyelidikan UPM,
Bahagian Canselor
Universiti Putra Malaysia
43400 UPM SERDANG
Selangor Darul Ehsan.

Tuan,

Daftar Progress Projek Penyelidikan IRPA Q1 2001 (Jan – Mac 2001)

Dengan segala hormatnya saya merujuk kepada perkara di atas.

Sukacita bersama-sama dengan ini saya sertakan dua salinan daftar progress projek penyelidikan IRPA Q1 2001 (Jan – Mac 2001) bagi projek “Implementing MTEN’s recommendation : Identification, mapping and reclassification of mangrove forest using a combination of aerial photography, remote sensing and geomorphological techniques” yang mengandungi :

1. Milestone achievement report
2. Project activity report
3. Financial report

Sekian untuk makluman dan tindakan pihak tuan selanjutnya.

Terima kasih.

Yang benar,

.....
SULONG BIN IBRAHIM

s.k

Sekretariat Penyelidikan KUT.

Financial Report

A. **Project Number** : 01-02-04-0395
Project Title : Implementing MTEN's recommendation: Identification, mapping and reclassification of mangrove forest using a combination of aerial photography, remote sensing and geomorphological techniques
Project Leader : Mr. Sulong Ibrahim

B. **Actual project expenditure** (Please report the expenditure for the past quarter)

Year : 2001 Quarter : ☒ Jan-Mar ☐ April-June ☐ Jul-Sep ☐ Oct-Dec

Project Cost Components	Actual Expenditure RM
• Salaried personnel (11100)	2,350.00
• Temporary and contract personnel (J 400)	6,300.00
Sub-total staff costs	8,650.00
• Travel and transportation (J 500)	
• Rentals (J 600)	730.00
• Research materials and supplies (J 700)	1,560.00
• Minor modifications and repairs (J 800)	
• Special services (J 900)	
• Special equipment and accessories (J 1000)	165.00
Sub-total direct expenses	2,455.00
Total	11,105.00

Is this performance in line with plan ? ☒ Yes ☐ No (Please complete Sections C and D)

C. **Reasons for variations from budget** (Please provide the reasons)

D. **Proposed corrective action** (Please provide details of the proposed action)

Date : April.23.2001

Signature : 

Project Activity Report

A.	Project Number : 01-02-04-0395 Project Title : Implementing MTEN's recommendation: Identification, mapping and reclassification of mangrove forest using a combination of aerial photography, remote sensing and geomorphological techniques Project Leader : Mr. Sulong Ibrahim
B.	Project Activity Year : 2001 Quarter : ☒ Jan-Mar ☐ April-June ☐ Jul-Sep ☐ Oct-Dec Ground survey was successfully conducted by January 2001; Along Chukai river and around mangrove forest reserve to check the accuracy of maps. The mangrove forest types along Chukai river and Pulau Che Wan Dagang were determined by using aerial photographs and Remote Sensing images. The maps of the mangrove forest types of Pulau Che Wan Dagang was successfully printed. Remote Sensing images were analysed to determine the extent of mangrove availability around the study area.
C.	Milestone Achivement Have you achive any milestone ? ☒ Yes (Please attach the Key Milestone Achievement Report form) ☐ No

Milestone Achievement Report

A.	Project Number : 01-02-04-0395 Project Title : Implementing MTEN's recommendation: Identification, mapping and reclassification of mangrove forest using a combination of aerial photography, remote sensing and geomorphological techniques Project Leader : Mr. Sulong Ibrahim Tel : 09- 6696411 Fax : 09-6694660
B.	Milestone achievement (Please attach the original project schedule from Section VI of the Application Form) Milestone Name : 1.) Land cover and land use maps of mangrove areas 2.) Ground verification to check accuracy of maps and sample collection soils. 3.) Geomorphological analysis of maps and sample collections. Planned Milestone : January 2001 – March 2001 Achieved : ☒ Yes ☐ No (If no, please complete Sections C, D and E) Ground survey was successfully conducted by January 2001; Along Chukai river and around mangrove forest reserve to check the accuracy of maps. The mangrove forest types along Chukai river and Pulau Che Wan Dagang were determined by using aerial photographs and Remote Sensing images. The maps of the mangrove forest types of Pulau Che Wan Dagang was successfully printed.
C.	Reasons for non-achievement (Please give the reasons for non-achievement of the milestone) Delay in milestone achievement due to project initiation delayed by 8 months caused by late funding.
D.	Suggested adjustments to the project approach (Please state the changes you propose) 1) All milestone date to be revised and delayed by 8 months
E.	Impact on project schedule (Please attach revised project schedule, if applicable) Revised date for this milestone : All milestone to be delayed by 8 months New date of project completion : August 2001 Original date : Dec 2000
F.	Impact on project budget (Please attach revised project budget, if applicable)

Original approved project	RM	207,800.00
Revised project budget	RM	154,000.00
Date : April.23.2001 Signature : 		



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UNIVERSITI PUTRA MALAYSIA

Fakulti Sains dan Teknologi
(Faculty Science and Technology)

Ruj. Kami (Our ref.) : KUT/FST/TD (PPS)/2-2/2/1 (72)
Tarikh (Date) : 14hb. April 2001

En. Mohd Izham bin Ismail
Ketua
Unit Penyelidikan Canseleri
Universiti Putra Malaysia
43400 UPM Serdang
Selangor Darul Ehsan

51581
3
51451

Tuan,

DAFTAR PROGRES PENYELIDIKAN IRPA Q12001 (JAN - MAC 2001)

Dengan segala hormatnya saya merujuk kepada perkara yang tersebut di atas.

Sukacita bersama-sama ini disertakan daftar progres penyelidikan IRPA (Jan - Mac 2001) bagi pensyarah-pensyarah yang berkenaan untuk makluman dan tindakan pihak tuan seterusnya.

Sekian, terima kasih.

Saya yang menjalankan tugas,

(PROF. DR. HAMDAN SUHAIMI)
Timbalan Dekan
Penyelidikan dan Siswazah

s.k - Fail Edaran

Dr

Financial Report

A. Project number: 51581

Project title: Useful pigment products (carotenoid, astaxanthin, phycocyanin, phycoerythrin, etc.) from tropical algae and their application in aquaculture

Project leader: Prof Lokman Shamsudin

Tel: 09 6683252

Fax: 09 6694660

B. Actual Project Expenditure (Please report the expenditure for the past quarter)

Year: **Quarter:** ☒ Jan-Mar ☐ Apr-Jun ☐ Jul-Sep ☐ Oct-Dec

Project Cost Components	Actual Expenditure RM
• Salaried personnel (I1100)	
• Temporary and contract personnel (J 400)	23 25.00
Sub-total staff costs	
• Travel and transportation (J 500)	1270.70
• Rentals (J 600)	
• Research materials and supplies (J 700)	
• Minor modifications and repairs (J 800)	
• Special services (J 900)	
• Special equipment and accessories (J 1000)	2050.00
Sub-total direct expenses	
Total	7398.90

Is this performance in line with plan? ☒ Yes ☐ No (Please complete Sections C and D)

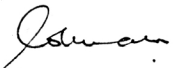
C. Reasons for variations from budget (Please provide the reasons)

D. Proposed corrective action (Please give details of the proposed action)

Date: Mac 2001

Signature: 

Milestone Achievement Report

A. Project number: 51581	
Project title:	Useful pigment products (carotenoid, astaxanthin, phycocyanin, etc.) from tropical algae and their application in aquaculture
Project leader:	Prof lokman Shamsudin
Tel:	09 6683252
Fax:	0 66946609
B. Milestone achievement (Please attach the original project schedule from Section VI of the Application Form)	
Milestone name:	Isolation, trial cultivation of suitable candidate strain in laboratory
Planned milestone date:	August 2002
Achieved:	☐ Yes ☒ No (If no, please complete Sections C, D, E and F)
Milestone description (Please provide a short description of the milestone achieved)	
C. Reasons for non-achievement (Please give the reasons for non-achievement of the milestone)	
We are still collecting sample from the wild to get the right candidate strain especially blue green algae	
D. Suggested adjustments to the project approach (Please state the changes you propose)	
Our target to achieve this goal is August 2002 probably a bit later in culturing the strain under controlled environment	
E. Impact on project schedule (Please attach revised project schedule, if applicable)	
Revised date for this milestone:	September 2002
New date of project completion:	Early 2004
Original date:	Late 2003
F. Impact on project budget (Please attach revised project budget, if applicable)	
Original approved project budget:	RM 56486 in 2001
Revised project budget:	RM
Date:	Mac 2001
Signature:	

- 124

Project Activity Report

A. Project Number : 01-02-04-0402 (51451)

Project Title : Assessing impacts of aquaculture project on coastal sedimentation processes.

Project Leader : Rosnan bin Yaacob

Address : Faculty of Science and Technology, Kolej Universiti Terengganu, 21030 Kuala Terengganu.

B. Project Activity

Year: 2001 Quarter: ☒ Jan-Mar ☐ Apr-Jun ☐ Jul-Sep ☐ Oct-Dec

Sampling

Three new sampling areas were established at Kelantan, Pahang and Kedah. Field work was started from February 2001 and continuously every month for one year duration. All sampling works will cover both conditions of monsoon season (Southwest and Northeast monsoon). Sediments from samplings stations was collected and analysed for their characteristic and percentage distribution. Beach profile work was also carried out around sampling stations every three month duration.

Data Analysis

Data from the various samplings were still been analysed using the dry and wet sieving techniques. Computer programme is still developed to analysis the data obtained.

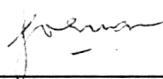
C. Milestone Achievement

Have you achieve any milestone?

☐ Yes (Please attach the **Key Milestone Achievement Report** form)

☒ NO

Financial Report

A. Project number: 01-02-04-0402 Project title : Assessing impacts of aquaculture project on coastal sedimentation processes. Project leader: Rosnan bin Yaacob Address : Faculty of Science and Technology, Kolej Universiti Terengganu, 21030 Kuala Terengganu. Tel: 09-6683303 Fax: 09-6692166	
Actual Project Expenditure (Please report the expenditure for the past quarter) Year: 2001 Quarter: ☒ Jan-Mar ☐ Apr-Jun ☐ Jul-Sep ☐ Oct-Dec	
Project Cost Components	Actual Expenditure RM
* Salaried personnel (11100)	-
* Temporary and contract personnel (J 400)	3,600.00
Subtotal staff costs	3,600.00
* Travel and transportation (J 500)	0.00
* Rentals (J 600)	0.00
* Research materials and supplies (J 700)	301.90
* Minor modifications and repairs (J 800)	0.00
* Special services (J 900)	0.00
* Special equipment and accessories (J 1000)	0.00
Sub-total direct expenses	301.90
Total	3,901.90
Is this performance in line with plan? ☒ Yes ☐ No (Please complete Sections C and D)	
Reasons for variations from budget (Please provide the reasons)	
Proposed corrective action (Please give details of the proposed action)	
Date: 9-4-2001.	Signature: 



KOLEJ UNIVERSITI TERENGGANU

UNIVERSITI PUTRA MALAYSIA

Fakulti Sains dan Teknologi
(Faculty Science and Technology)

5

Ruj. Kami (Our ref.)

: KUT/FST/TD (PPS)/2-2/2/1 (69)

Tarikh (Date)

: 3hb. April 2001

En. Mohd Izham bin Ismail
Ketua
Unit Penyelidikan Canseleri
Universiti Putra Malaysia
43400 UPM Serdang
Selangor Darul Ehsan

51570

51546

51482

Tuan,

DAFTAR PROGRES PENYELIDIKAN IRPA Q12001 (JAN - MAC 2001)

Dengan segala hormatnya saya merujuk kepada perkara yang tersebut di atas.

Sukacita bersama-sama ini disertakan daftar progres penyelidikan IRPA (Jan - Mac 2001) bagi pensyarah-pensyarah yang berkenaan untuk tindakan pihak tuan seterusnya.

Sekian, terima kasih.

Saya yang menjalankan tugas,

(PROF. DR. HAMDAN SUHAIMI)

Timbalan Dekan

Penyelidikan dan Siswazah

A. Project number: 01 - 02 - 04 - 0520 (OSP)

Project title: Genetic improvement of the Giant Freshwater (*Macrobrachium rosenbergii*) and the development of culture technology for previously unexploited local species of *macrobrachium* in Malaysia

Project leader: Aizam Zainal Abidin

Tel: 09 - 6683320

Fax: 09 - 6694660

B. Actual Project Expenditure (Please report the expenditure for the past quarter)

Year: **Quarter:** ☒ Jan-Mar ☐ Apr-Jun ☐ Jul-Sep ☐ Oct-Dec

Project Cost Components	Actual Expenditure RM
• Salaried personnel (11100)	-
• Temporary and contract personnel (J 400)	6674.20
Sub-total staff costs	-
• Travel and transportation (J 500)	-
• Rentals (J 600)	-
• Research materials and supplies (J 700)	-
• Minor modifications and repairs (J 800)	5610.00
• Special services (J 900)	1506.05
• Special equipment and accessories (J 1000)	-
Sub-total direct expenses	-
Total	13790.25

Is this performance in line with plan? ☒ Yes ☐ No (Please complete Sections C and D)

C. Reasons for variations from budget² (Please provide the reasons)

Not applicable

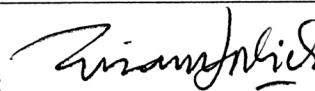
D. Proposed corrective action (Please give details of the proposed action)

Not applicable

Date:

12/3/01

Signature:



Milestone Achievement Report

A. Project number: 01 – 02 – 04 – 0520	
Project title:	Genetic improvement of the Giant Freshwater (<i>Macrobrachium rosenbergii</i>) and the development of culture technology for previously unexploited local species of <i>macrobrachium</i> in Malaysia
Project leader:	Aizam Zainal Abidin
Tel: 09 - 6683320	Fax: 09 - 6694660
B. Milestone achievement (Please attach the original project schedule from Section VI of the Application Form)	
Milestone name:	Identification of study areas and collection of samples.
Planned milestone date:	October 2000 – March 2001
Achieved:	☒ Yes ☐ No (If no, please complete Sections C, D, E and F)
Milestone description (Please provide a short description of the milestone achieved)	
i) Identification of study areas – completed	
ii) Field studies – completed	
iii) Collection of samples – started	
iv) Genetic analysis - Started	
C. Reasons for non-achievement (Please give the reasons for non-achievement of the milestone)	
Not applicable	
D. Suggested adjustments to the project approach (Please state the changes you propose)	
Not applicable	
E. Impact on project schedule (Please attach revised project schedule, if applicable)	
Revised date for this milestone:	Not applicable
New date of project completion:	-
Original date:	-
F. Impact on project budget (Please attach revised project budget, if applicable)	
Original approved project budget:	RM 147 000 (72 000)
Revised project budget:	RM 147 000.
Date: 12/3/01	Signature: 

Project Schedule

Project Schedule			2000			2001												2002								2003	
Project Activities	O	N	D	J	F	M	A	M	J	J	O	S	O	N	D	J	F	M	A	M	J	J	O	S	S1	S2	
1. Identification of study areas	√	√	•																						•		
2. Field studies			√	√	√	•	√	•	√	•	•	√	√	•											•	•	
3. Collection of samples			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√					√	√	
4. Genetic analysis						√	√	√	√	•	√	√	√	√	√	√	√	√	√	√	•				√	•	
5. Rearing experiments				√	√	√	•	√	√	√	•	√	√	√	•	√	√	√	•						√	•	
6. Selective breeding experiments													√	√	√	√	√	√	√	√			•		√	•	
7. Data analysis								√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√				
8. Report writing								√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√				
Technology Transfers Activities																											
Consultancy services												•												•	•	•	
Transfer of technology to shrimp farmers												•												•	•	•	

Planned milestone

S1: First Semester (January-June)

S2: Second Semester (July-December)

• Planned milestone

√ - Completed Milestone

Milestone Achievement Report

3

A. **Project number:** 51546

Project title: Studies on the Broodstock Management and Larva Rearing of Gouramy

Project leader: Dr. Abol Munafi Ambok Bolong

Tel: 09-6696411

Fax: 09-6694660

B. **Milestone achievement** (Please attach the original project schedule from Section VI of the Application Form)

Milestone name: Reproductive Cycle

Planned milestone date: December 2000 – January 2002

Achieved: ☐ Yes ☒ No (If no, please complete Sections C, D, E and F)

Milestone description (Please provide a short description of the milestone achieved)

C. **Reasons for non-achievement** (Please give the reasons for non-achievement of the milestone)

Not completed

D. **Suggested adjustments to the project approach** (Please state the changes you propose)

- Studies on the Maturation and Reproductive Cycle of Gouramy
- Studies on the Gonad Development (GSI)

E. **Impact on project schedule** (Please attach revised project schedule, if applicable)

Revised date for this milestone : December 2000 – January 2002

New date of project completion: December 2002

Original date: December 2002

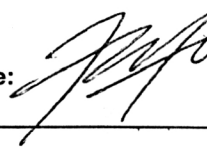
F. **Impact on project budget** (Please attach revised project schedule, if applicable)

Original approved project budget: RM _____

Revised project budget: RM _____

Date:

Signature:



Milestone Achievement Report

G. **Project number: 51546**

Project title: Studies on the Broodstock Management and Larva Rearing of Gouramy

Project leader: Dr. Abol Munafi Ambok Bolong

Tel: 09-6696411

Fax: 09-6694660

H. **Milestone achievement** (Please attach the original project schedule from Section VI of the Application Form)

Milestone name: Best Condition of Larvae Rearing Techniques

Planned milestone date: January 2001 – March 2002

Achieved: ☐ Yes ☒ No (If no, please complete Sections C, D, E and F)

Milestone description (Please provide a short description of the milestone achieved)

I. **Reasons for non-achievement** (Please give the reasons for non-achievement of the milestone)

Not completed

J. **Suggested adjustments to the project approach** (Please state the changes you propose)

- Studies on the best rearing conditions for larvae and juveniles
- Histomorphology studies on the development of various organ
- Grow-out studies

K. **Impact on project schedule** (Please attach revised project schedule, if applicable)

Revised date for this milestone : January 2001 – May 2002

New date of project completion: May 2002 **Original date:** May 2002

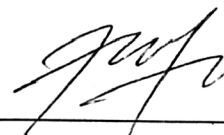
L. **Impact on project budget** (Please attach revised project schedule, if applicable)

Original approved project budget: RM _____

Revised project budget: RM _____

Date:

Signature:



Milestone Achievement Report

M. **Project number: 51546**

Project title: Studies on the Broodstock Management and Larva Rearing of Gouramy

Project leader: Dr. Abol Munafi Ambok Bolong

Tel: 09-6696411

Fax: 09-6694660

N. **Milestone achievement** (Please attach the original project schedule from Section VI of the Application Form)

Milestone name: Genetic Information

Planned milestone date: January 2001 – March 2002

Achieved: ☐ Yes ☒ No (If no, please complete Sections C, D, E and F)

Milestone description (Please provide a short description of the milestone achieved)

O. **Reasons for non-achievement** (Please give the reasons for non-achievement of the milestone)

Not completed

P. **Suggested adjustments to the project approach** (Please state the changes you propose)

- Analysis of relevant genetic information
- Genetic variation on different species of gouramy by using polymorphism of microsatellite DNA (MS) markers.

Q. **Impact on project schedule** (Please attach revised project schedule, if applicable)

Revised date for this milestone : May 2001 – May 2002

New date of project completion: May 2002 **Original date:** May 2002

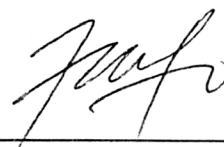
R. **Impact on project budget** (Please attach revised project schedule, if applicable)

Original approved project budget: RM _____

Revised project budget: RM _____

Date:

Signature:



Project Activity Report

A. Project Number: 51546

Project Title: Studies on the Broodstock Management and Larva Rearing of Gouramy.

Project Leader: Dr. Abol Munafi Ambok Bolong

B. Project Activity

Year: 2001 Quarter: ✓ Jan-Mar ___ Apr-Jun ___ Jul-Sep ___ Oct-Dec

Breeding of gouramy from genus *Trichogaster* sp. were conducted. Broodstock were put in the aquarium for spawning and breeding. Larvae hatched were used for experiments.

A study was conducted where larvae were fed by three different diets mainly probiotic bacteria, artificial plankton and Ziegler micropellet. Comparison studies on the growth and survival of gouramies larva fed by different diets were carried out for different species and varieties of members in genus *Trichogaster*.

A study was conducted to determine the effects of water quality on larva rearing by using three different sources of water mainly dechlorinated tap water, peat water, and green water. Larvae were exposed to the water and data such as survival rate, growth rate, Specific Growth Rate (SGR) and larvae qualities were observed for 2 weeks. Water quality parameters such as pH, DO, Temperature, Salinity, Conductivity and Ammonia were determined. All larvae were fed by the same diets.

Samples of gouramis were collected and preserved in absolute ethanol and stored in the freezer at -20°C prior for genetic studies. DNA extraction will be carried out using Qiagen DNeasy tissue extraction kit and determination of genetic differences of four species of genus *Trichogaster* and two varieties of *T. trichopterus* will be conducted using polymorphism of microsatellite DNA (MS) markers.

C. Milestone Achievement

Have you achieve any milestone?

___ Yes (Please attach the **Key Milestone Achievement Report** form)

✓ NO

Financial Report

A. Project number: 51546

Project title: Studies on the Broodstock Management and Larva Rearing of Gouramy

Project leader: Dr. Abol Munafi Ambok Bolong

Tel: 09-6696411

Fax: 09-6694660

B. Actual Project Expenditure (Please report the expenditure for the past quarter)

Year: **Quarter:** ☒ Jan-Mar ☐ Apr-Jun ☐ Jul-Sep ☐ Oct-Dec

Project Cost Components	Actual Expenditure RM
p Salaried personnel (11100)	1062.25
p Temporary and contract personnel (J 400)	-
Subtotal staff costs	-
p Travel and transportation (J 500)	-
p Rentals (J 600)	-
p Research materials and supplies (J 700)	13993.40
p Minor modifications and repairs (J 800)	-
p Special services (J 900)	-
p Special equipment and accessories (J 1000)	-
Sub-total direct expenses	
Total	15055.65

Is this performance in line with plan? ☒ Yes No (Please complete Sections C and D)

C. Reasons for variations from budget (Please provide the reasons)

D. Proposed corrective action (Please give details of the proposed action)

Date:

Signature:



Milestone Achievement Report

51482

2

A.	Project number:	01-02-04-0411	
	Project title:	TREATMENTS OF PETROLEUM HYDROCARBON RESIDUES IN SEDIMENT AND WATER FOR AQUACULTURE AND HATCHERY USES	
	Project leader:	Prof. LAW AH THEEM	
	Tel:	09-6683302	Fax:09-6694660
B.	Milestone achievement (Please attach the original project schedule from Section VI of the Application Form)		
	Milestone name:	EFFECT OF SOIL PARAMETERS ON OIL BIO-DEGRADATION IN SEDIMENT	
	Planned milestone date:	Jan-Mar. 2001	
	Achieved:	☒ Yes	☐ No (If no, please complete Sections C, D, E and F)
	Milestone description (Please provide a short description of the milestone achieved.)		
	Please refer to Lampiran		
C.	Reasons for non-achievement (Please give the reasons for non-achievement of the milestone)		
	NIL		
D.	Suggested adjustments to the project approach (Please state the changes you propose)		
	NIL		
E.	Impact on project schedule (Please attach revised project schedule, if applicable)		
	Revised date for this milestone:	Original date:	
	New date of project completion:		
F.	Impact on project budget (Please attach revised project budget, if applicable)		
	Original approved project budget:	RM	
	Revised project budget:	RM	
	Date:	Signature:	
	31.Mar. 2001		

(Lampiran)

As optimum conditions for the activities of AR3, an active oil degrading bacteria was assessed; protocols of a hydrocarbons treatment system in the crude oil contaminated marine sediment were established. Initial treatment of the system was to re-condition the sediment. Sediment to water ratio in the system was set to be 1:1.5. Higher ratio of water will reduce mixing efficiency; where as lower ratio of water will affect activities of the oil degrading bacteria in the system. Nutrient content in the sediment will be investigated prior to the application of the treatment system. Process of fertilization will be practiced if the ratio of nitrogen: phosphorous is lower than 20:1. Sediment pH played key role in the process of biodegradation in the crude oil contaminated sediment. Liming will be applied to the system in order to adjust the sediment pH to 7.5-8.2. After the sediment system was re-conditioned, microbial seeding will be inoculated into the system. 4.6×10^{12} cells/ kg of AR3 will be inoculated and hence initial the process of biodegradation in the sediment. An incubation period of 6 day will be applied to the system. Through out the process, water content and sediment pH will be monitored to ensure optimal activities of the oil-degrading bacteria. The application of this system 405.96 mg/kg of crude oil was degraded in the sediment that contaminated with 1200 mg/kg o. Petronas Tapis A crude oil in the laboratory. Crude oil degraded in the system was approximately 38.33%. Percentage of the crude oil degraded by the treatment system was not up to satisfactory. Thus, second phase of the treatment was introduced into the system in order to further provoke system performance. Water in the first phase will be flushed during second phase and system was re-conditioned. New batch of the active oil degrading bacteria will be inoculated into the system. Incubation periods of the treatment system will be prolonged to 14 days. Further assessment of the system efficiency in the degradation of crude oil will be assessed.

Financial Report

A. Project number:01-02-04-0411

Project title: TREATMENT OF PETROLEUM HYDROCARBON RESIDUES IN SEDIMENT AND
WATER FOR AQUACULTURE AND HATCHERY USES

Project leader: Prof. Law Ah Theem

Tel:09-6683302

Fax:09-6694660

E-Mail :
atlaw@upmt.edu.my

B. Actual Project Expenditure (Please report the expenditure for the past quarter)

Year:2001 Quarter: ☒ Jan-Mar ☐ Apr-Jun ☐ Jul-Sep ☐ Oct-Dec

Project Cost Components	Actual Expenditure RM
• Salaried personnel (11100)	7,603.2
• Temporary and contract personnel (J 400)	-
Sub-total staff costs	7,603.2
• Travel and transportation (J 500)	536.0
• Rentals (J 600)	-
• Research materials and supplies (J 700)	8,914.5
• Minor modifications and repairs (J 800)	
• Special services (J 900)	-
• Special equipment and accessories (J 1000)	
Sub-total direct expenses	9,450.5
Total	17,053.7

Is this performance in line with plan? ☒ Yes ☐ No (Please complete Sections C and D)

C. Reasons for variations from budget (Please provide the reasons)

Nil

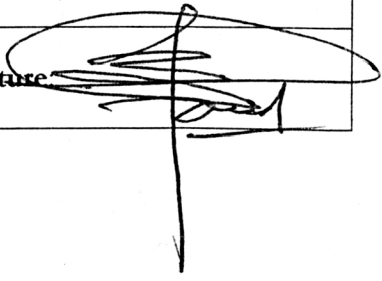
D. Proposed corrective action (Please give details of the proposed action)

Nil

Date:31.3.2001

Signature: 

Milestone Achievement Report

A.	Project Number : 08-02-04-0100 Project Title : Geochemical Indicators of the Past Productivity in the Mangrove Forest Sediments Project Leader : Dr. Kamaruzzaman Yunus Tel : 09-6696411/412 Fax : 09-6694660
B.	Milestone achievement (Please attach the original project schedule from Section VI of the Application Form) Milestone Name: 1) Laboratory work 2) Data analysis. 3) Report writing 4) Attending conferences/seminar Planned Milestone: January - March 2001 for No. 1, 2, 3, 4. Achieved : ☐ Yes ☒ No (If no, please complete Sections C, D and E) Milestone description (Please provide a short description of the milestone achievement) Laboratory works have started on August 2000 and still on going. Some of 5 the data's were analysis using statistical analysis
C.	Reasons for non-achievement (Please give the reasons for non-achievement of the milestone)
D.	Suggested adjustments to the project approach (Please state the changes you propose)
E.	Impact on project schedule (Please attach revised project schedule, if applicable)
F.	Impact on project budget (Please attach revised project budget, if applicable) Original approved project RM 99,000.00 Revised project budget RM 120,000.00
Date: 5 April 2001 Signature: 	

Financial Report

A. Project number : 08-02-04-0100

Project title : Geochemical Indicators of the Past Productivity in the Mangrove Forest Sediments

Project leader : Dr. Kamaruzzaman Yunus

Tel : 09-6696411/412

Fax : 09-6694660

E-Mail : kama63@hotmail.com

B. Actual project expenditure (Please report the expenditure for the past quarter)

Year : 2001 Quarter : ☒ Jan-Mar ☐ April-June ☐ Jul-Sep ☐ Oct-Dec

Project Cost Components	Actual Expenditure RM
• Salaried personnel (11100)	3,000.00
• Temporary and contract personnel (J 400)	8,000.00
Sub-total staff costs	11,000.00
• Travel and transportation (J 500)	-
• Rentals (J 600)	
• Research materials and supplies (J 700)	10,000.00
• Minor modifications and repairs (J 800)	-
• Special services (J 900)	-
• Special equipment and accessories (J 1000)	-
Sub-total direct expenses	10,000.00
Total	21,000.00

Is this performance in line with plan? ☐ Yes ☐ No (Please complete Sections C and D)

C. Reasons for variations from budget (Please provide the reasons)

D. Proposed corrective action (Please provide details of the proposed action)

Date: 5 April 2001

Signature:



Project Activity Report

A. Project Number : 08-02-04-0100

Project Title : Geochemical Indicators of the Past Productivity in the Mangrove Forest Sediments

Project Leader : Dr. Kamaruzzaman Yunus

B. Project Activity

Year : 2001 Quarter ☒ Jan-Mar ☐ April-June ☐ Jul-Sep ☐ Oct-Dec ☐

Laboratory works have started on August 2000 and the analysis is on going.

Preanalysis of metals and carbon content was successfully done. However, laboratory works for all metal and carbon have started on August 2000 and the analysis is on going

Date: 5 April 2001

Signature:

