

出國報告（出國類別：開會）

第 8 屆國際水生動物健康研討會
(8th International Symposium on Aquatic
Animal Health , ISAAH 8)

服務機關：行政院農委會家畜衛生試驗所

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摘要

為發表研究成果 *Bacillus cereus* Infections in Soft-Shelled Turtles in Taiwan(甲魚仙人掌桿菌感染症),報名參加第 8 屆國際水生動物健康研討會 8th International Symposium on Aquatic Animal Health (ISAAH 8)。該會為美國水產學會 (American Fisheries Society, AFS) 下之魚類健康部門 (Fish Health Section, FHS) 所舉辦 4 年一次的年會, 主要議題包含細菌、病毒、黴菌、原蟲、寄生蟲等傳染性疾病, 水產養殖飼養管理與健康管理等議題。本次會議口頭報告中有來自泰國與中南美洲國家學者發表吳郭魚湖泊病毒 (Tilapia lake virus, TiLV) 的最新疫情與致病機制研究, 也有愛德華氏菌 (*Edwardsiella* spp.) 最新種別分類狀況與在不同魚種分布情形。而筆者亦有與與會者口頭討論蝦類急性肝胰腺壞死症 (acute hepatopancreatic necrosis disease, AHPND 或 early mortality syndrome, EMS) 在美國疫情擴散的狀況與亞利桑那大學蝦類病理課程資訊。新興疾病的發生會造成水產養殖業不可預估的經濟損失, 台灣已發生吳郭魚湖泊病毒, 雖然目前疫情已無進一步爆發, 但由國外疫情傳播狀況與致病機制研究可以了解控制該病的策略, 並觀察主要吳郭魚養殖國家對該病疫苗研發的進度。另外蝦病研究上應與其他國家合作以了解各國對於蝦傳染性疾病的防治措施。參加國際會議可吸收新知, 尤其是國外目前疾病盛行狀況與防治措施, 可立即應用到本國水產動物健康管理上。亦能夠增加台灣與本所之國際能見度, 促進台灣參與國際間合作計畫與水產疫情監控。

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目的

本所為發表細菌室有關動物細菌疾病診斷研究，增加本所國際能見度，與國外研究學者交流，吸收疾病診斷新知以改進細菌檢診服務，報名參加第 8 屆國際水生動物健康研討會 International Symposium on Aquatic Animal Health (ISAAH 8)，並以壁報發表研究成果 *Bacillus cereus* Infections in Soft-Shelled Turtles in Taiwan (甲魚仙人掌桿菌感染症)。仙人掌桿菌 (*Bacillus cereus*) 是環境中的常在菌，屬於革蘭氏陽性兼性厭氧桿菌，並且可以產生孢子，主要存在於土壤與水中，但是常藉由污染食物或飲水使得人類產生食物中毒，像是米飯、乳品等，甚至是水產品，都有被仙人掌桿菌污染而造成人類食物中毒的病例。仙人掌桿菌的致病機制主要是因為可以產生毒素，仙人掌桿菌毒素可以分為兩種，分別是嘔吐毒素 (emetic toxin) 與腸毒素 (enterotoxin)。而其食物中毒的症狀也分為兩種，分別是下痢型與嘔吐型。而仙人掌桿菌除了在人類引起食物中毒之外，在動物應不會引起嚴重感染，少數狀況是在牛羊引起伺機性感染的乳房炎。在 2014 年有文獻指出在中國有蘇力菌 (*B. thuringiensis*) 感染造成甲魚 (soft-shelled turtle) 感染大量死亡的病例，而相似的時間在台灣南部也有甲魚養殖場出現甲魚大量死亡的狀況，病例送至地方主管機關動

物疾病防治所或動物保護處，也分離出桿菌（*Bacillus* sp.）。本所收集病例與各地送至本所之分離菌株經鑑定與研究後發現，引起台灣甲魚大量死亡的桿菌並非如同中國甲魚病例之病原蘇力菌，台灣甲魚病例的病原為仙人掌桿菌。兩種細菌不同之處在於，蘇力菌可以殺死昆蟲細胞，因為其帶有結晶毒素（crystal toxin），而仙人掌桿菌則無此基因。關於國際性的水產獸醫研討會，主要有美國的水產學會（American Fisheries Society，AFS）下之魚類健康部門（Fish Health Section，FHS）所舉辦4年一次的年會，即為本次所參加之國際水生動物健康研討會ISA AH；另外歐洲系統則為歐洲魚類病理獸醫師學會（European Association of fish Pathologists，EAFP）所舉辦2年一次的年會，將於2019年於葡萄牙召開第19屆魚貝類疾病國際研討會（19th International Conference on Diseases of Fish and Shellfish）；而相對於其國際性，亞洲水產學會（Asian Fisheries Society）下之魚類健康部門FHS每3年舉辦一次之亞洲水產疾病研討會（The Symposium on Diseases in Asian Aquaculture，DAA）參與人員較區域性，且已於2017年在印尼舉辦過第10屆年會。故選擇參加ISA AH 8年會發表台灣甲魚仙人掌感染症報告，並利用會議與各國學者交流。

過程

本屆的國際水生動物健康研討會 ISAAH 8 由加拿大愛德華王子島大學（University of Prince Edward Island）的亞特蘭大獸醫學院（Atlantic Veterinary College）協助辦理，時間為 9 月 2 日至 9 月 6 日，於愛德華王子島夏洛特敦（Charlottetown）的愛德華王子三角洲飯店（Delta Prince Edward Hotel）附設之會議中心（PEI Convention Centre）舉行（如附圖）。大會於 9 月 2 日於亞特蘭大獸醫學院提供會前免費課程，課程包含診斷技術的敏感性與特異性評估、論文撰寫、病理檢查、二枚貝的解剖與檢查及魚類與無脊椎動物的採血技術等。筆者於報名時即選取論文撰寫課程 Publishing Piscatorial Papers: The Dos and Don'ts 與虛擬顯微鏡病理學課程 Uses of Virtual Microscopy in Diagnostic Fish Pathology。故於台北時間 9 月 1 日啟程，由台北經日本東京與加拿大蒙特婁，於當地時間 1 日深夜到達夏洛特敦。會前課程的內容十分精彩，上午論文撰寫課程主要講師 Dr. Jeff Wolf 為病理專科醫師 DACVP，於實驗動物病理公司（Experimental Pathology Laboratories, Inc., EPL）執業多年，專長為魚類毒物病理學，亦為毒物病理雜誌期刊編輯，有多年研究與發表經驗。下午的虛擬顯微鏡病理學課程主要講師 Dr. Rod Getchell 為美國康乃爾大學獸醫學院的老

師，也是 AQUAVET II 水產動物病理學課程的負責人，講解利用掃描數位化病理切片，應用於遠距診斷與教學研究，由於 Dr. Getchell 於水生動物傳染病診斷與控制上極有經驗，故於會後再與其接觸討論後續邀請來台灣指導交流。

9 月 3 日至 6 日為正式的會議，會議每日上午 8:30-9:30 均安排大會演講 Keynote speech，為精心挑選的重要研究題目，包含免疫學、疾病診斷與致病機制、寄生蟲學、營養學等等（議程如附錄），雖然時間只有約 1 小時，但是內容極為豐富。接下來則分時段進行不同題目的口頭發表與壁報論文發表，壁報發表區分細菌、病毒、寄生蟲等不同主題，總共約 94 篇，在固定時段發表人須出席接受詢問，而許多發表者為研究生，並且參與競賽。因筆者研究題目為細菌，許多的壁報發表題目也與細菌相關，尤其偏重於抗生素感受性與藥物治療的研究，可以應用於台灣水產疾病，故於壁報發表時段也與其他壁報發表作者交流與討論。例如編號 28 之 Who's Driving The Bus? A Puzzling Case of Tilapia Morbidity and Mortality in an Aquaponics System，作者為美國威斯康辛大學動物疾病診斷實驗室的魚病獸醫師，討論近來熱門題目魚菜共生（aquaponics）系統中吳郭魚的死亡與疾病，十分的有趣，可以應用於近來農委會辦理食農教育中各級學校常推廣之魚菜共生系統可能遇到的問題；另外編號 24 之 Investigation of

Antimicrobial Resistance in Fecal *Escherichia coli* in Seals from Canadian Atlantic and Arctic Waters，研究人員為愛德華王子島亞特蘭大獸醫學院魚病研究團隊，研究加拿大大西洋和北極圈沿岸海豹糞便中大腸桿菌的藥物感受性，以了解海豹受到環境中抗生素污染的情形，作為 one health 議題中一個重要人畜共通抗藥性問題的研究，可以做為未來台灣水產動物抗生素抗藥性監測的一個參考方法。

口頭報告的時段為 9:30 之後到下午 5 點，為上午與下午各兩個時段，分別位於 4 個不同的演講廳。主要議題包含細菌、病毒、黴菌、原蟲、寄生蟲等傳染性疾病，免疫學、疫苗、微生物體學(microbiome)、貝類與無脊椎動物疾病、吳郭魚疾病、觀賞魚疾病、水產養殖飼養管理與健康管理等議題。本次會議口頭報告中有來自泰國與中南美洲國家學者發表吳郭魚湖泊病毒 (Tilapia lake virus, TiLV) 的最新疫情與致病機制研究，TiLV 於世界各地有養殖吳郭魚的國家快速傳播，包含台灣也於去年 (106) 度於野生吳郭魚驗到本病毒並且通報世界動物衛生組織 (OIE)，雖然本病非 OIE 表列之動物傳染病，但是因吳郭魚為重要經濟魚種，能夠提供廉價的動物性蛋白質，故對於吳郭魚養殖的國家，本病仍是十分的重要。與會學者除了交流 TiLV 於各國的疫情與致害之外，亦有朝向研發疫苗防治的共識。本所持續收集台灣 TiLV 病例，可留意本病毒的研究與疫苗開發狀態，進一步參與國

際合作。另有愛德華氏菌 (*Edwardsiella* sp.) 最新種別分類狀況與在不同魚種分布情形的研究報告，以往感染水產動物的愛德華氏菌為 *E. tarda* 與 *E. ictaluri*，現今則分類為 *E. tarda*、*E. hoshinae*、*E. piscicida*、*E. anguillarum*、與 *E. ictaluri* 等，*E. piscicida* 與 *E. anguillarum* 為新分類菌種，在台灣可能都會被誤診為 *E. tarda*，在未來魚病檢診時需特別注意。

因筆者另有關於魚鏈球菌研究題目，而本次會議有一口頭報告引起筆者注意，是美國加州大學戴維斯分校 Dr. Esteban Soto 的實驗室發表的 *Characterization of Streptococcus iniae* Isolates From Diseased Wild and Farmed Fish Across the North American Continent，Dr. Soto 的實驗室大概是目前美國研究魚類鏈球菌最多且持續的實驗室，該篇口頭報告中除了有北美地區分離之海豚鏈球菌分類，還有建立以經口投與方式評估鏈球菌毒力表現。因目前商品化的魚鏈球菌疫苗多半提供經口或浸泡方式投與，但是探求其疫苗技術文件中對於此種途徑的攻毒評估試驗均無描述，抑或是無法於實驗室中重複此種攻毒模式，因此本報告對於魚鏈球菌毒力表現與致病機制研究很有幫助。筆者於會後找到該口頭報告之報告者 Taylor Heckamn 博士生與之討論實驗細節，Taylor 並提供實驗器材廠牌型號供筆者參考。另外筆者亦有與與會者 Jessica Koppien-Fox 口頭討論蝦類急性肝胰腺壞死症 (*acute*

hepatopancreatic necrosis disease, AHPND 或 early mortality syndrome , EMS) 在美國疫情擴散的狀況, Jessica Fox 女士為 Ralco 公司的獸醫總監, 該公司於美國本土與中南美洲飼養蝦類, Jessica 有多年魚蝦疾病診療與防治經驗, 經詢問蝦類微孢子蟲診斷法, Jessica 建議可以參加亞利桑那大學提供之蝦類病理課程。

大會除了於 9 月 2 日開幕晚宴之外, 4 日晚間於該市藝術中心 (Confederation Centre of the Arts) 舉行與會者交流晚宴, 讓與會者能夠互相認識, 另外 3 日與 5 日均有晚宴, 7 日全天的實地參訪行程, 但是需要額外繳費, 由於花費甚鉅, 為節省公帑, 均未報名參加。因主辦單位會後有提供與會者通訊錄, 故於會後仍可連絡其他與會者。

心得及建議

心得

本次會議內容包含許多議題，與本所業務有關與筆者最有興趣的部分在於新興疾病與多重感染（coinfection）的討論。新興疾病的發生會造成水產養殖業不可預估的經濟損失，台灣已發生吳郭魚湖泊病毒，雖然目前疫情已無進一步爆發，但由國外疫情傳播狀況與致病機制研究可以了解控制該病的策略，並觀察主要吳郭魚養殖國家對該病疫苗研發的進度。泰國研究結果顯示吳郭魚湖泊病毒的死亡率為50%-90%，比起台灣疫情死亡率高出許多，泰方學者認為是因多重感染造成高死亡率，但吳郭魚湖泊病毒造成多重感染的機制還待進一步研究。另外蝦病研究上可與其他國家合作，以了解各國對於蝦傳染性疾病的防治措施。

建議

1. 參加國際會議可吸收新知，尤其是國外目前疾病盛行狀況與防治措施，可立即應用到本國水產動物健康管理上。
2. 參加國際會議亦能夠增加台灣與本所之國際能見度，促進台灣參與國際間合作計畫與水產疫情監控。

附圖



圖 1.大會會場：愛德華王子三角洲飯店（Delta Prince Edward Hotel）

附設之會議中心。圖 2.筆者於會場與會人員 Where are you visiting

from?看板留影。圖 3.筆者發表海報。圖 4.會前課程虛擬顯微鏡病理

學資料。圖 5.全體與會人員合影。

附錄

大會議程

8th ISAHH Program Overview											
Sunday Sept - 2nd		Time	Room	Monday Sept - 3rd	Tuesday Sept - 4th	Wednesday Sept - 5th	Thursday Sept - 6th	Friday Sept - 7th			
Buses To Workshops at AVC		7:30-8:15	Convention Foyer	Breakfast in Foyer Outside Main Ballroom				Buses for Field Trip			
		8:15-9:30	Gray / Palmer / Pope	Amusements - Gray / Palmer / Pope Ballrooms							
		8:30-9:15		Keynote Speaker Dr. David R. Bressan	Keynote Speaker Dr. Huaning Sun	Keynote Speaker Dr. Jiri Bartolomae	Keynote Speaker All-Hands Meeting				
Pre-Conference Workshops at AVC		9:15-9:30		Transition to Simultaneous Sessions							
Publication Des & Don'ts 9:00 am - 12:00 pm		9:30-10:30	Gray / Palmer / Pope	IMMUNOLOGY-1	BACTERIOLOGY-1	MYXOZOA-1	VIROLOGY-4				
		9:30-10:30	Archibald / Campbell	FLAVIBACTERIUM-1	SEA LICE-1	ORNAMENTAL-1	HEALTH MANAGEMENT-1				
		9:30-10:30	Tilly / Topper	AAFY	WAYMA	DISEASE OF WILD FISH-1	GENOMICS-1				
Diagnostic Testing 9:00 am - 5:00 pm		9:30-10:30	Langere / Carlier	MICROBIOLOGY-1	ZEBRA FISH / LAB ANIMAL	VIROLOGY-1	RNA METAGENOMICS				
		9:30-10:30	MacDonald	INDUSTRY SESSIONS				QASH			
Fish Health Section Executive Meeting 10:00 am - 11:30 am MacDonald Ballroom		10:30-10:45	Coles	Posters on Display				OPEN			
		10:45-12:15	Gray / Palmer / Pope	IMMUNOLOGY-2	BACTERIOLOGY-2	MYXOZOA-2	VIROLOGY-5				
		10:45-12:15	Archibald / Campbell	FLAVIBACTERIUM-2	SEA LICE-2	ORNAMENTAL-2	HEALTH MANAGEMENT-2				
Publication Des & Don'ts 9:00 am - 12:00 pm		10:45-12:15	Tilly / Topper	AAFY	WAYMA	DISEASES OF WILD FISH-2	GENOMICS-2				
		10:45-12:15	Langere / Carlier	MICROBIOLOGY-2	INVERT / SHELLFISH-1	VIROLOGY-2	PARASITOLOGY-1				
Diagnostic Testing 9:00 am - 5:00 pm		10:45-12:15	MacDonald	INDUSTRY SESSIONS				QASH			
		10:45-12:15	Coles	Posters on Display				OPEN			
POSTER SET UP (COLLABORATION)	Registration Open Outside Convention Center Foyer	Buses to Workshops at AVC	12:15-1:15	Foyer	Lunch Outside Main Ballroom in Foyer						
			1:15-1:45	Gray / Palmer / Pope	VACCINES-1	BACTERIOLOGY-3	Keynote Speaker Dr. Nabeel Ahmad (1:00 Start)	VIROLOGY-6		Field Trip (All Day)	
			1:45-3:00	Archibald / Campbell	THALAPIA HEALTH-1	SEA LICE-3	MYXOZOA-3	HEALTH MANAGEMENT-3			
			1:45-3:00	Tilly / Topper	AAFY	WAYMA	NUTRITION & FISH HEALTH	CO-INFECTIONS			
			1:45-3:00	Langere / Carlier	LIFE CYCLES	INVERT / SHELLFISH-2	AQUATIC EP-2	PARASITOLOGY-2			
			1:15-3:00	MacDonald	PARTNERING SESSIONS * (Partnering meetings will be held in from 12:45 - 3:00 Monday - Wednesday)				QASH		
			1:15-3:00	Coles	Posters on Display				OPEN		
			3:00-3:15	Foyer	Refreshment Break in Foyer						
			3:15-5:15	Gray / Palmer / Pope	VACCINES-2	BACTERIOLOGY-4	MYXOZOA-4	VIROLOGY / EMERGENT DIS			
			3:15-5:15	Archibald / Campbell	THALAPIA HEALTH-2	CLEANER FISH-2	EMERGENT DISEASE	OPEN			
	3:15-5:15	Tilly / Topper	AAFY	WAYMA	ANTIBIOTIC S / PHARMA	MISCELLANEOUS					
	3:15-5:15	Langere / Carlier	GILL HEALTH	AQUATIC EP-1	VIROLOGY-3	HUSBANDRY / PHYSIO					
	3:15-5:15	MacDonald	OPEN				QASH				
	5:00-6:30	Coles	Posters on Display				FHS Business Meeting	Closing Remarks			
Buses from Workshops in Convention Center		5:00-6:00		Official Poster Session		Official Poster Session		Poster Removal	OPEN		
Student Reception - Stevens McGee Room		6:00-6:30		Buses to Off-Site Event							
OPENING RECEPTION		6:30-8:30	Gray / Palmer / Pope	Off-Site Event at Fort Amherst Historic Park	Discover Charlottetown Event at Confederation Center	ISAHH RECEPTION & BANQUET Keynote Speaker Dr. Adil El-Morisi		Free Evening			



Field Trip
(All Day)



NOTE: Final Scientific Program available at www.isaah2018.com

SUNDAY, SEPTEMBER 2ND – Registration & Pre-conference workshops

- 8:30AM – 12:30PM: Registration Open for Pre-Conference Workshops**
Atlantic Veterinary College, University of Prince Edward Island
- 9:30AM – 5:00PM: Pre-Conference Workshops** (Sponsored by the Atlantic Veterinary College)
Atlantic Veterinary College, University of Prince Edward Island
- 10:00AM – 11:30AM: Fish Health Section Executive Meeting**
MacDonald Room, Delta Prince Edward Hotel Conference Centre
- 12:00PM – 6:30PM: Registration / Partnering Help Desk Open**
Delta Prince Edward Hotel Conference Centre foyer
- 12:00PM – 6:30PM: Poster Check-in & Set up**
Coles Room, Delta Prince Edward Hotel Conference Centre
- 5:00PM – 7:00PM: ISA AH 2018 Student Reception** (Sponsored by the Fish Health Section)
Steeves McGee Hospitality Suite, Mezzanine Level
Delta Prince Edward Hotel
- 6:30PM – 8:30PM: ISA AH 2018 Welcome Reception**
Harbourview Deck, Delta Prince Edward Hotel

MONDAY, SEPTEMBER 3RD – Prince Edward Island Day

- 7:30AM – 6:00PM: Registration / Partnering Help Desk Open**
Delta Prince Edward Hotel Conference Centre foyer
- 7:30AM – 8:15PM: Continental Breakfast**
Delta Prince Edward Hotel Conference Centre foyer
- 8:15AM – 8:30AM: Welcome Remarks & Opening of ISA AH 2018**
Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre
- 8:30 – 9:15AM: Keynote Presentation by Dr. Daniel R. Barreda**, Professor, Animal Immunity and Health, Department of Biological Sciences and Department of Agricultural, Food and Nutritional Science, University of Alberta, Canada
"Contributions of early cellular responses to immune protection in fish"
Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre

- 9:30AM – 5:00PM: **AAFV Sessions** (see page 23 for schedule)
Tilly Tupper Room
- 9:30AM – 12:15PM: **Industry Sessions** (Sponsored by Springboard / Synapse)
(see page 29 for presentation schedule)
MacDonald Room, Delta Prince Edward Hotel Conference Centre
- 9:30AM – 10:30AM: **Breakout Sessions**
Immunology I: Gray, Palmer, Pope Ballroom
Flavobacterium I: Archibald Campbell Breakout Room
Microbiome I: Langeve Cartier Breakout Room
- 9:30AM – 5:00PM: **Posters on Display**
Coles Ballroom, Delta Prince Edward Hotel Conference Centre
- 10:30AM – 10:45AM: **Refreshment Break**
Delta Prince Edward Hotel Conference Centre Foyer
- 10:45AM – 12:15PM: **Breakout Sessions**
Immunology II: Gray, Palmer, Pope Ballroom
Flavobacterium II: Archibald Campbell Breakout Room
Microbiome II: Langeve Cartier Breakout Room
- 12:15PM – 1:15PM: **Lunch**
Buffet served in the Delta Prince Edward Hotel Conference Centre Foyer
- 12:45PM – 3:05PM: **Partnering Meetings**
MacDonald Room, Delta Prince Edward Hotel Conference Centre
- 1:15PM – 3:00PM: **Breakout Sessions** (Tilapia Sessions sponsored by IDT/Ridgeway/Gallant Laboratories)
Vaccines I: Gray, Palmer, Pope Ballroom
Tilapia Health I: Archibald Campbell Breakout Room
Life Cycles: Langeve Cartier Breakout Room
- 3:00PM – 3:15PM: **Refreshment Break**
Delta Prince Edward Hotel Conference Centre Foyer
- 3:15PM – 5:00PM: **Breakout Sessions** (Tilapia Sessions sponsored by IDT/Ridgeway/Gallant Laboratories)
Vaccines II: Gray, Palmer, Pope Ballroom
Tilapia Health II: Archibald Campbell Room
Gill Health: Langeve Cartier Breakout Room
- 5:00PM – 6:00PM: **Official Poster Session-I**
Coles Ballroom, Delta Prince Edward Hotel Conference Centre (Cash Bar)

6:00PM: **Buses Depart for Off-site Cultural Event at Fort Amherst Historic Site**
(Buses will depart from the front of the Delta Prince Edward Hotel front doors at 6:00pm sharp)

6:30PM – 10:00PM: **Off-site Cultural Event & Feast**
Skmaqñ–Port-la-Joye–Fort Amherst National Historic Site

TUESDAY, SEPTEMBER 4TH – Nova Scotia Day

7:30AM – 5:30PM: **Registration / Partnering Help Desk Open**
Delta Prince Edward Hotel Conference Centre foyer

7:45AM – 8:15AM: **Continental Breakfast**
Delta Prince Edward Hotel Conference Centre foyer

8:15AM – 8:30AM: **Announcements**
Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre

8:30 – 9:15AM: **Keynote Presentation by Dr. Henning Sørum**, Professor at the School of Veterinary Medicine, Norwegian University of Life Sciences, Oslo, Norway

“Bacterial skin ulcers in farmed fish; preventive effect of vaccines and probiotics”

Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre

9:30AM – 5:00PM: **WAVMA Sessions** (see page 24 for schedule)
Tilly Tupper Room, Delta Prince Edward Hotel Conference Centre

9:30AM – 12:15PM: **Ocean Supercluster Workshop Part I** (see page 27 for schedule)
MacDonald Room, Delta Prince Edward Hotel Conference Centre

9:30AM – 10:30AM: **Breakout Sessions**
Bacteriology I: Gray, Palmer, Pope Ballroom
Sea Lice I: Archibald Campbell Breakout Room
Zebrafish / Lab Animal: Langeve Cartier Breakout Room

9:30AM – 5:00PM: **Posters on Display**
Coles Ballroom, Delta Prince Edward Hotel Conference Centre

10:30AM – 10:45AM: **Refreshment Break**
Delta Prince Edward Hotel Conference Centre Foyer

- 10:45AM – 12:15PM: Breakout Sessions**
 Bacteriology II: Gray, Palmer, Pope Ballroom
 Sea Lice II: Archibald Campbell Breakout Room
 Invert/Shellfish I: Langeve Cartier Breakout Room
- 12:15PM – 1:15PM: Lunch**
 Buffet served in the Delta Prince Edward Hotel Conference Centre Foyer
- 12:45PM – 3:05PM: Partnering Meetings**
 MacDonald Room, Delta Prince Edward Hotel Conference Centre
- 1:15PM – 3:00PM: Breakout Sessions** (Tilapia Sessions sponsored by IDT/Ridgeway/Gallant Laboratories)
 Bacteriology III: Gray, Palmer, Pope Ballroom
 Sea Lice III: Archibald Campbell Breakout Room
 Cleaner Fish I: Archibald Campbell Breakout Room
 Invert Shellfish I: Langeve Cartier Breakout Room
- 3:00PM – 3:15PM: Refreshment Break**
 Delta Prince Edward Hotel Conference Centre Foyer
- 3:15PM – 5:00PM: Breakout Sessions** (Tilapia Sessions sponsored by IDT/Ridgeway/Gallant Laboratories)
 Bacteriology IV: Gray, Palmer, Pope Ballroom
 Cleaner Fish II: Archibald Campbell Breakout Room
 Aquatic EPI I: Langeve Cartier Breakout Room
- 5:00PM – 6:00PM: Official Poster Session-II**
 Coles Ballroom, Delta Prince Edward Hotel Conference Centre (Cash Bar)
- 6:30 – 8:30PM: Discover Charlottetown Reception** (Sponsored by Elanco Canada Limited)
 Memorial Hall, Confederation Centre of the Arts

WEDNESDAY, SEPTEMBER 5 – Newfoundland Day

- 7:30AM – 6:30PM: Registration/Partnering Help Desk Open**
 Delta Prince Edward Hotel Conference Centre foyer
- 7:30AM – 8:15PM: Continental Breakfast**
 Delta Prince Edward Hotel Conference Centre foyer
- 8:15AM – 8:30AM: Announcements**
 Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre

- 8:30 – 9:15AM: **Keynote Presentation by Dr. Jerri Bartholomew**, Professor and Head of the OSU Department of Microbiology and Director of the John L. Fryer Aquatic Animal Health Laboratory
- "Weapons of Micro-destruction: An interdisciplinary approach to understanding a parasitic cnidarian"**
- Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre
- 9:30AM – 12:15PM: **Ocean SuperclusterWorkshop Part II** (see page 27 for schedule)
MacDonald Room, Delta Prince Edward Hotel Conference Centre
- 9:30AM – 10:30AM: **Breakout Sessions**
- | | |
|-------------------------|----------------------------------|
| Myxozoa I: | Gray, Palmer, Pope Ballroom |
| Ornamental I: | Archibald Campbell Breakout Room |
| Disease of Wild Fish I: | Tilly Tupper Breakout Room |
| Virology I: | Langeve Cartier Breakout Room |
- 9:30AM – 5:00PM: **Posters on Display**
Coles Ballroom, Delta Prince Edward Hotel Conference Centre
- 10:30AM – 10:45AM: **Refreshment Break**
Delta Prince Edward Hotel Conference Centre Foyer
- 10:45AM – 12:15PM: **Breakout Sessions**
- | | |
|--------------------------|----------------------------------|
| Myxozoa II: | Gray, Palmer, Pope Ballroom |
| Ornamental II: | Archibald Campbell Breakout Room |
| Disease of Wild Fish II: | Tilly Tupper Breakout Room |
| Virology II: | Langeve Cartier Breakout Room |
- 12:15PM – 1:15PM: **Lunch**
Buffet served in the Delta Prince Edward Hotel Conference Centre Foyer
- 12:45PM – 3:05PM: **Partnering Meetings**
MacDonald Room, Delta Prince Edward Hotel Conference Centre
- 1:00PM – 1:45PM: **Keynote Presentation by Dr. Sabo-Attwood**, Associate Professor and Chair of the Department of Environmental and Global Health and a member of the Center for Environmental and Human Toxicology and Emerging Pathogens Institute at the University of Florida
- "Nano-Evolution: Balancing safety and applications of nanotechnology in aquatic systems"**

- 1:45PM – 3:00PM: Breakout Sessions** (Sponsored by Skretting)
- | | |
|--------------------------|----------------------------------|
| Myxozoa III: | Gray, Palmer, Pope Ballroom |
| Nutrition & Fish Health: | Archibald Campbell Breakout Room |
| Aquatic EPI II: | Tilly Tupper Breakout Room |
| Toxicology/Path: | Langeve Cartier Breakout Room |
- 3:00PM – 3:15PM: Refreshment Break**
Delta Prince Edward Hotel Conference Centre Foyer
- 3:15PM – 5:00PM: Breakout Sessions**
- | | |
|---------------------|----------------------------------|
| Myxozoa IV: | Gray, Palmer, Pope Ballroom |
| Emergent Disease: | Archibald Campbell Breakout Room |
| Antibiotics/Pharma: | Tilly Tupper Breakout Room |
| Virology III: | Langeve Cartier Breakout Room |
- 5:00 – 6:30PM: Fish Health Section Business Meeting**
MacDonald Room, Delta Prince Edward Hotel Conference Centre
- 6:30PM – 11:00PM: ISAAH 2018 Awards Banquet & Reception** (Sponsored by Marine Harvest Canada)
Keynote Presentation by Dr. Adel El-Mowafi, Aquaculture Technology
Application Director, Cargill Aqua Nutrition, Norway
- “Role of nutrition to mitigate diseases in aquaculture”**
Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre

THURSDAY, SEPTEMBER 6TH – New Brunswick Day

- 7:30AM – 5:30PM: Registration/Partnering Help Desk Open**
Delta Prince Edward Hotel Conference Centre foyer
- 7:30AM – 8:15PM: Continental Breakfast**
Delta Prince Edward Hotel Conference Centre foyer
- 8:15AM – 8:30AM: Announcements**
Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre
- 8:30 – 9:15AM: Keynote Presentation by Alf-Helge Aarskog**, Chief Executive Officer (CEO)
of Marine Harvest ASA
- “Without good fish health – no blue revolution”**
Gray, Palmer, Pope Ballroom, Delta Prince Edward Hotel Conference Centre

- 9:30AM – 5:00PM: **QASH Sessions** (see page 25 for schedule)
MacDonald Ballroom, Delta Prince Edward Hotel Conference Centre
- 9:30AM – 10:30AM: **Breakout Sessions**
 Virology IV: Gray, Palmer, Pope Ballroom
 Health Management: Archibald Campbell Breakout Room
 Genomics I: Tilly Tupper Breakout Room
 eDNA Metagenomics: Langeve Cartier Breakout Room
- 10:30AM – 10:45AM: **Refreshment Break**
Delta Prince Edward Hotel Conference Centre Foyer
- 10:45AM – 12:15PM: **Breakout Sessions**
 Virology V: Gray, Palmer, Pope Ballroom
 Health Management: Archibald Campbell Breakout Room
 Genomics II: Tilly Tupper Breakout Room
 Parasitology I: Langeve Cartier Breakout Room
- 12:15PM – 1:15PM: **Lunch**
Buffet served in the Delta Prince Edward Hotel Conference Centre Foyer
- 1:15PM – 3:00PM: **Breakout Sessions**
 Virology VI: Gray, Palmer, Pope Ballroom
 Health Management: Archibald Campbell Breakout Room
 Confections: Tilly Tupper Breakout Room
 Parasitology II: Langeve Cartier Breakout Room
- 3:00PM – 3:15PM: **Refreshment Break**
Delta Prince Edward Hotel Conference Centre Foyer
- 3:15PM – 5:00PM: **Breakout Sessions**
 Virology/Emergent DIS: Gray, Palmer, Pope Ballroom
 Miscellaneous: Tilly Tupper Breakout Room
 Husbandry/Physio: Langeve Cartier Breakout Room
- 5:00PM – 6:00PM: **Closing Remarks & ISAAH 2018 Wrap-up**

FRIDAY, SEPTEMBER 7TH – Field Trip Day

- 8:00AM – 6:00PM: **Bus departs Delta Prince Edward Hotel for PEI Field Trip**

壁報發表題目

No.	Name	Poster Title	Student
1	Landis, Eric	Aquaculture Drugs: What Are They And Why Does Fda Review Matter?	No
2	Crosby, Tina	Epidemiological Cutoff Value Analysis Of 229 Mics From Standard Testing Of Flavobacterium Columnare Isolates By Four Laboratories	No
3	Ulloa, Pilar	Effect Of B-Glucans On Intestinal Health In Zebrafish And Yellowtail Kingfish	No
4	Soto-Davila, Manuel	Antibacterial Effects Of Cholecalciferol In Atlantic Salmon (<i>Salmo Salar</i>) Primary Macrophages Infected With <i>Aeromonas Salmonicida</i> .	Yes
5	Kang, So Young	Efficacy Of Optimized Rhns Vermiciflua Stokes Extracts Against Edwardsielliosis In Experimental And Field Trials In Olive Flounder <i>Paralichthys Olivaceus</i>	No
6	Soto, Esteban	Pharmacokinetic Parameters Following A Single Intravenous Administration Of 10 Mg/Kg Of Natamycin To White Sturgeon (<i>Acipenser Transmontanus</i>)	No
7	Jung-Schroers, Verena	Development Of Antibiotic Resistances In Bacteria Isolated From Ornamental Fish And Fish For Food Production Between 2005 And 2017	No
8	Jung-Schroers, Verena	Diagnostic Methods For The Identification Of Different <i>Aeromonas</i> Spp. And Examination Of Their Pathogenicity Factors And Their Cytotoxicity And Adherence To Fish Mucus	No
9	Jung-Schroers, Verena	Identification And Pathogenicity Of <i>Vibrio</i> Spp. From Recirculating Aquaculture Systems For Pacific White Shrimps (<i>Litopenaeus Vannamei</i>)	No
10	Jung-Schroers, Verena	Methods For Identification And Differentiation Of <i>Shewanella</i> Spp. Isolates For Diagnostic Use	No
11	Ghosh, Satyaki	Molecular Detection And Quantification Of The Fish Pathogen <i>Saprolegnia</i> Using Qpcr And Loop Mediated Isothermal Amplification (Lamp).	Yes
12	Soto, Esteban	Investigating The Role Of The Type VI Secretion System (T6ss) In The Emergent Fish Pathogen <i>Francisella Noanumensis</i> Subsp. <i>Orientalis</i> (Changed to Oral)	No
13	Weatherhead, Rebekah	The Influence Of Water Temperature On Juvenile Nile Tilapia (<i>Oreochromis Niloticus</i>) Gene Expression Patterns When Challenged With <i>Saprolegnia Parasitica</i>	Yes
14	Sebastião, Fernanda	Molecular Detection Of <i>Francisella Noanumensis</i> Subsp. <i>Orientalis</i> In Cultured Nile Tilapia (<i>Oreochromis Niloticus</i>) In Three Brazilian States	No
15	Olmos, Paola	Antimicrobial Susceptibility And Classification Of <i>Piscirickettsia</i> Salmonis Isolates From Southern Chile	No
16	Romero, Alex	Biofilm Formation By <i>Piscirickettsia</i> Salmonis Isolates Under Different Culture Conditions	No
17	Hossain, Ahmed	Role Of Cold Shock Proteins In <i>Aeromonas Salmonicida</i> .	Yes
18	Sanguinetti, Gina	Characterization Of A Pathogenic <i>Yersinia Ruckeri</i> Strain Isolated From A Fishfarm In Puno, Peru	No
19	Namba, Aki	Characterization And Pathogenicity Of <i>Edwardsiella Piscicida</i> From Peled, Coregonus Peled (Gmelin), In Japan	No

20	Vasquez, Jose I.	Characterization And Draft Genome Of <i>Vibrio Anguillarum</i> J360 Marine Pathogen Isolated From An Outbreak In Lumpfish (<i>Cyclopterus Lumpus</i>)	Yes
21	Phillips, Kenneth	<i>Vagococcus Salmoninarum</i> As The Causative Agent Of Mortality In Brook Trout <i>Salvelinus Fontinalis</i>	No
22	Huang, Tzu-Ming	<i>Bacillus Cereus</i> Infections In Soft-Shell Turtles In Taiwan	No
23	Illanes, Oscar	Challenge Of Nile Tilapia <i>Oreochromis Niloticus</i> With <i>Salmonella</i> <i>Enterica</i> Typhimurium In A Recirculating Aquaponics System	No
24	Powell, Ashley	Investigation Of Antimicrobial Resistance In Fecal <i>Escherichia Coli</i> In Seals From Canadian Atlantic And Arctic Waters	Yes
25	Choual, Khayr-Eddine	First Confirmed Report On Stranding Of A Pygmy Sperm Whale " <i>Kogia Breviceps</i> " (Blainville, 1838) At The Algerian Eastern Coast	Yes
26	Choual, Khayr-Eddine	Using The Macrobenthic Fauna As Bioindicator Of Microbiological Pollution Of The Lake Mellah (North-East Of Algeria)	Yes
27	Kane, Andrew	Seafood Workers Are Aquatic Animals Too: Surveillance Of Health, Injuries And Fatalities Along The U; Gulf Coast (Changed to Oral)	No
28	Hvu, Hui-Min	Who's Driving The Bus? A Puzzling Case Of Tilapia Morbidity And Mortality In An Aquaponics System	No
29	Ahasan, Shamim	Determining The Etiology Of An Emerging Ulcerative Disease In Invasive Lionfish	Yes
30	Rashed, Rabar	Physiological Responses To High Carbohydrates In Common Carp (<i>Cyprinus Carpio</i> L.) Diet	No
31	Midtlyng, Paul	Improvement Of Environmental Parameters (Oxygen Saturation And Water Temperature) Using "Midt Norsk Ringen" In Salmon Cages (Withdrawn)	No
32	Loucarevic, Semir	Regulations For Equipment And Methods Of Disinfection For Water Used In Fish Slaughter And Processing Plant	No
33	Falade, Abiodun	Effect Thymol and Cinnamaldehyde Essential Oils on Nutrition and Health Management of African Catfish (<i>Clarias gariepinus</i>)	Yes
34	Powell, Mark	Fish And Shellfish Health Research At The Institute Of Marine Research, Bergen	No

35	Rhee, Jae-Sung	Comparative Analysis Of Distinctive Transcriptome Profiles With Biochemical Evidence In Bisphenol S- And Benzo[A]Pyrene-Exposed Liver Tissues Of The Olive Flounder <i>Paralichthys Olivaceus</i>	No
36	Quiroga, Isabel	Approaching The Puzzle Underneath Skeletal Anomalies In Senegalese Sole <i>Senegalensis</i>	No
37	Rhee, Jae-Sung	Ichthyotoxic Dinoflagellates Induce Dna Damage, Lipid Peroxidation, And Antioxidant Response In The Gill Tissue Of Red Seabream <i>Pagrus Major</i>	No
38	Petursson, Hrolfur	Source, Transmission And Development Of Ichthyophonus Hoferi Infection In The Icelandic Summer-Spawning Herring	Yes
39	Mladineo, Ivona	Anisakis Pegreffii Extracellular Vesicles: Tem And Proteomic Characterisation (Withdrawn)	No
40	Cho, Jaebum	Amoebic Gill Infestation Of Juvenile Rockbream (<i>Oplegnathus Fasciatus</i>)	No
41	Mladineo, Ivona	Pathogenesis Of Anisakis Pegreffii Experimental Infection In The Accidental Host Model Inferred By Rna Seq: Clues To Elucidate Infection In Humans (Withdrawn)	No
42	Mladineo, Ivona	The Ultrastructure Of Anisakis Spp. L3 Larva (Withdrawn)	No
43	Skern-Mauritzen, Rasmus	A Copepodid Is Not A Copepodid	No
44	Woodyard, Ethan	Investigations Into The Life Cycle And Pathology Of <i>Odhneriotrema Incommodum</i> In Wild-Caught Alligator <i>Mississippiensis</i>	Yes
45	Gorgoglione, Bartolomeo	Modulating Vhsr And Hsv Matrix Proteins To Regulate General Host Cell Transcription And Innate Antiviral Responses	No
46	Umasuthan, Navaneethaier	Impact Of Co-Stimulation With Sea Lice <i>Lepeophtheirus Salmonis</i> And Poly(I:C) On The Atlantic Salmon Dorsal Skin Transcript Expression	No
47	Godard, Danielle	Detection, Diagnosis, And Monitoring Of Acipenserid Herpesvirus 1 (<i>Acilv1</i>) In Lake Sturgeon In Wisconsin	No
48	Jung, Sung-Ju	Efficacy Of Plant Extracts, Kc-100 Against Viral Hemorrhagic Septicemia Virus (Vhsv)	No
49	Subramaniam, Kuttichantran	A Putative New Family Of "Minimal" Nucleo-Cytoplasmic Large Dna Viruses Distantly Related To Iridoviruses	No
50	Jung-Schroers, Verena	Infectious Spleen And Kidney Necrosis Virus (<i>Isknv</i>) In Ornamental Fish In Germany	No
51	Vieira, Diego	Morphological And Molecular Analysis Of <i>Henneguya</i> Sp., A New Gill Parasite Of <i>Prochilodus Lineatus</i> From Brazil	no
52	Vieira, Diego	Phylogenetic Analysis Of <i>Myxobolidae</i> Family Parasites From Brazilian Fish	Yes
53	Abdallah, Vanessa	Preliminary Phylogenetic Analysis Of <i>Henneguya</i> Sp. Found Parasitizing Stomach Of <i>Serrassalmus Spilopleura</i> From Brazil	No
54	Capodifoglio, Kattia	Morphological And Molecular Characterization Of Two New Species Of <i>Myxobolus</i> And Of <i>Myxobolus Colossomatis</i> Infecting <i>Colossoma Macropomum</i> From The Amazon Basin	Yes

55	Atkinson, Stephen	Novel Species And Cryptic Sources Of Ceratomyxa Parasites In The Upper Klamath Basin	No
56	Bailey, Christyn	Seq. Drugs And Pkd: An Rna – Sequencing Analysis Of A Biological And Chemical Stressor And Their Consequences For Fish	No
57	Bailey, Christyn	Do Fish Get Wasted? Assessing The Influence Of Effluents On Parasitic Infection Of Wild Fish	No
58	Kovacevic, Nikola	<i>Myxobolus Cerebralis</i> Laboratory Testing In Alberta	No
59	Quiroga, Ma Isabel	Integrating Old And New Findings: Recent Advances In Turbot <i>Enteromyzosis</i>	No
60	Muraroli Ribeiro, Amanda	Morphological Analysis And Molecular Of New <i>Aurantiactinomyxon</i> Type (<i>Cnidaria: Myxosporae</i>) In <i>Oligochaetes</i> From Fish Farms, Brazil	Yes
61	Wang, Pei-Chi	Molecular Confirmation Of <i>Kudoa Iwatsui</i> (<i>Myxosporae: Multivalvulida</i>) In Cultured Rock Bream <i>Oplegnathus Fasciatus</i> In Taiwan	No
62	Ali, Haytham	Hepatic Granuloma In A Wild-Caught King Soldier Bream (<i>Argyrops Spinifer</i>) From The Gulf Of Oman.	No
63	Nekouei, Omid	Spatiotemporal Distribution Of Infectious Agents In Juvenile Fraser River Sockeye Salmon	No
64	De Buron, Isaure	Pathology Induced By Blood Flukes <i>Cardicola</i> Spp. In Spotted Seatrout <i>Cynoscion Nebulosus</i>	No
65	Quintanilla, Juan	Infection And Horizontal Transmission Of <i>Piscirickettsia Salmonis</i> Between The Wild Fish Sub-Antarctic Notothenioid Patagonian Blenny <i>Eleginops Maclovinus</i> And Rainbow Trout <i>Oncorhynchus Mykiss</i> By A Model Of Cohabitation Challenge	No
66	Silbernagel, Constance	Health Assessment Of Wild White Seabass <i>Atractoscion Nobilis</i> – A Species Cultured For Coastal Replenishment In California	No
67	Smith, Pedro	Testing For Piscine Orthoreovirus And Lesions Associated With Heart And Skeletal Muscle Inflammation In Wild <i>Gemypterus Chilensis</i> From The Pacific Ocean In The North Of Chile	No
68	Kane, Andrew	Look Deep Into My Shell: Gross And Radiographic Observations Of Shell Damage By Boring Parasites In The Eastern Oyster <i>Crassostrea Virginica</i> (Changed to Oral)	No
69	Lee, Do-hee	Monitoring Of Microplastic Dynamics And Analysis Of Ecotoxicological And Physiological Effects In Marine Mysid	Yes

70	Le, Cuong	Genetic Relatedness Of White Spot Syndrome Virus Isolated From Imported Frozen Shrimp Products: And An Outbreak In Shrimp <i>Penaeus Monodon</i> Farm In Australia	Yes
71	Perera, N. C. N.	Antiproliferative Responses Upon Viral Hemorrhagic Septicemia Virus Of Interferon Induced Gene Identified From Disk Abalone (<i>Haliotis Discus Discus</i>)	Yes
72	Sandamaliha, Gayashani	A Cytosolic Glutathione S-Transferase, Gst-Theta (Gst-θ) From Disk Abalone (<i>Haliotis Discus Discus</i>): Insights To Molecular And Biochemical Properties	Yes
73	Chakraborty, Setu	Immunization Against <i>Vibrio Anguillarum</i> In <i>Cylopterus Lumpus</i> With Vibrogen 2 Commercial Vaccine	Yes
74	Chakraborty, Setu	Vaccination Of Atlantic Salmon (<i>Salmo Salar</i>) Against <i>Aeromonas Salmonicida</i> (Withdrawn)	Yes
75	Carriero, Mateus	Molecular Cloning And Gene Expression Analysis Of The Cytokines Il1b And Il8 Of Pacu (<i>Piaractus Mesopotamicus</i>) Infected With <i>Aeromonas Dhakensis</i>	No
76	Jung, Sumi	Insights Into Two Ferritin Subunits From Red-Lip Mullet (<i>Liza Haematocheila</i>): Potential Antibacterial Activity With Its Immune Response	Yes
77	Kankanamge, Omeke	Molecular And Transcriptional Insight Into Gstk1 In Red-Lip Mullet <i>Chelon Haematocheilus</i>	Yes
78	Chen, Shih-Chiu	Differential Functional Gene Expression In Koi Carp (<i>Cyprinus Carpio</i>) After Challenge With <i>Aeromonas Sobria</i>	No
79	Gonzalez-Stegmaier, Roxana	Recombinant Flagellin Of <i>Vibrio Anguillarum</i> And Derived Peptides From D1 Domain Promote In Vivo An Acute Overexpression Of Il-1β And Il-8 Proinflammatory Cytokines In <i>Salmo Salar</i>	No
80	Liyanage, Dileepa	Molecular Characterization And Immune Profiling Of Cathepsin D From Redlip Mullet (<i>Chelon Haematocheilus</i>).	Yes
81	Perera, Naranjan	Antiviral Protein Viperin- Transcriptional Modulation Patterns Upon Immune Stimulant: From Big Belly Seahorse <i>Hippocampus Abdominalis</i> .	Yes
82	Hikima, Junichi	Interaction Of Soluble- And Membrane-Forms Of Toll-Like Receptor 5 Induce Expression Of Interleukin-1β Gene In Japanese Flounder, <i>Paralichthys Olivaceus</i>	No
83	Sakai, Masahiro	Il-17a/F1 Modulates Production Of Antimicrobial Peptides In The Intestine Of Japanese Medaka, <i>Oryzias Latipes</i>	No
84	Trung, Cao Thanh	<i>Vibrio Anguillarum</i> Vaccine Candidates For Lumpfish (<i>Cylopterus Lumpus</i>)	Yes
85	Adamek, Mikolag	Immune Responses To Carp Edema Virus Infection In Common Carp – A Model For Immunosuppression?	No
86	Adamek, Mikolag	Resistance Vs Type I Interferon Responses In Viral Infection Models Of Common Carp	No
87	Adamek, Mikolag	Piscine Orthoreovirus 1 And 3 Detected As A Co-Infecting Agents During Furunculosis In Germany	No
88	Adamek, Mikolag	First Detections Of Carp Edema Virus In Hungary, Croatia And Serbia Confirm Very Wide Distribution Of The Virus In Europe	No
89	Adamek, Mikolag	Evaluation Of New Virus Infection Models For Zebrafish	No
90	Thiel, Whitney	Antibody Development And Serologic Test Validation In Juvenile Northern Pike <i>Esox Lucius</i> Experimentally Infected With Viral Hemorrhagic Septicemia Virus	Yes

91	Rodrigues, Thais	Genomic Characterization Of A Novel Pegivirus Species In Wild Bottlenose Dolphins <i>Tursiops Truncatus</i>	Yes
92	Rodrigues, Thais	Phylogenomic Characterization Of A Novel Rhabdovirus Isolated From A Stranded Harbour Porpoise <i>Phocoena Phocoena</i>	Yes
93	Björnsdóttir, Þórunn Sóley	Sequence Analysis Of The Hpr And Fusion Gene Of Hpr0 Isolates Of Isav In Iceland	No
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壁報發表摘要

No. 22 *Bacillus cereus* Infections in Soft-Shelled Turtles in Taiwan

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Several bacterial infections in soft-shelled turtles (SST) (*Trionyx sinensis*) have been noticed in southern Taiwan since 2014. Clinical signs of abnormal and slow swimming, anorexia, and sudden death were observed. Hemorrhage in laryngeal region, ascites, enlargement of liver and spleen were found. Completely hemolytic colonies were obtained on blood agar plates from ascites, heart, liver, spleen and kidney. Based on the Vitek 2 biochemical characterization, 16s rDNA sequencing, and no crystal toxin production, the etiology was identified as *Bacillus cereus*. The multilocus sequence type (MLST) analysis revealed that the SST isolate was closest to ST234 with one base mutation in *glpF* and *pta*, respectively. Virulence factors of hemolysin BL (hbl) and nonhemolytic enterotoxin (nhe) were detected by polymerase chain reaction in the SST isolates. The isolate was sensitive to tetracycline and erythromycin, but resistant to trimethoprim/sulfamethoxazole by minimum inhibitory concentration (MIC) test. The *B. cereus* isolate showed virulence in SST by intraperitoneal inoculation. To author's knowledge, this is the first case of *B. cereus* infection in SST in Taiwan.

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