

出國報告 (出國類別: 開會)

參加「第 29 屆含鹵素持久性有機污染
物國際研討會(戴奧辛 2009)」

服務機關：行政院農委會農業藥物毒物試驗所

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摘要

第 29 屆含鹵素持久性有機污染物國際研討會(戴奧辛 2009) 「29th International Symposium on Halogenated Persistent Organic Pollutants (Dioxin 2009)」由中國主辦，並於北京國際會議中心(Beijing International Convention Center)舉行，研討會會期自 8 月 23 日至 8 月 28 日，共計 6 日。本屆研討會探討內容包括：戴奧辛(PCDDs)、呋喃(PCDFs)、多氯聯苯(PCBs)、多環芳香烴化合物(PAHs)、溴化阻燃劑類化合物 (Brominated Flame Retardants)、全氟化物(PFCs, perfluoroalkyl chemicals)及有機氯農藥(OCPs)等持久性有機污染物(POPs)在 Analysis、Environment levels and fate、Exposure (human and environmental exposure)、Food and feed safety, drinking water、Toxicology & Risk Assessment、Sources, formation and control measures、Control technologies and policies、Hot issues and related areas 等八大主題上之研究，共計發表 700 篇論文，其中以溴化阻燃劑類化合物 (Brominated Flame Retardants)為此次會議中最被關注的持久性有機污染物。2008 年愛爾蘭及智利發生的豬肉戴奧辛污染事件，其起因為飼料資材遭到戴奧辛污染所致，因此，如何避免水畜產品遭受戴奧辛污染，監控飼料中的戴奧辛含量是一大關鍵，此一議題亦被深入探討。

徐慈鴻等研究人員於此次研討會中發表論文一篇「Determination of PCDDs/DFs and dioxin-like PCBs in egg and fish feed samples in Taiwan by the DR CALUX[®] bioassay」，並於會議期間以壁報展示論文內容及進行學術交流，參加國際研討會除可增加相關研究領域之專業知識並增進國際交流。

關鍵詞：持久性有機污染物、戴奧辛、多氯聯苯、溴化阻燃劑、多環芳香烴化合物、全氟化物。

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一、目的

我國於 2005-2006 年分別發生鴨蛋及羊肉的戴奧辛污染事件，本所於 2006-2008 年奉農委會指派分別成立戴奧辛生物快速篩檢實驗室及化學分析實驗室，以協助監測我國農水畜產品中的戴奧辛類化合物含量，維護農水畜產品的食用安全；本次奉派參加「第 29 屆含鹵素持久性有機污染物國際研討會(戴奧辛 2009)」之主要目的是希望透過持久性有機污染物(POPs)研究的年度重要會議，瞭解國際間有關持久性有機污染物研究之最新趨勢，包括 POPs 的檢測分析技術、生態及毒理研究、污染事件的探討、相關法規及允許限值的訂定等；並將本所之研究成果透過論文及壁報展示與其他國家相關領域之研究人員進行學術交流，建立聯絡管道，提升本會(農委會)以及本所之研究水準及國際能見度，此外，在研討會中也可以瞭解其他國家面臨農水畜產品戴奧辛污染事件時的危機處理經驗及後續補救措施，可為我國之借鏡及參考。

二、過程

第 29 屆「國際鹵化持久性有機污染物－戴奧辛研討會」，於中國北京市舉行，研討會會場為北京市朝陽區的北京國際會議中心(Beijing International Convention Center，圖一)，會期自 98 年 8 月 23 日至 28 日，共計 6 日。



圖一、會議地點-北京國際會議中心

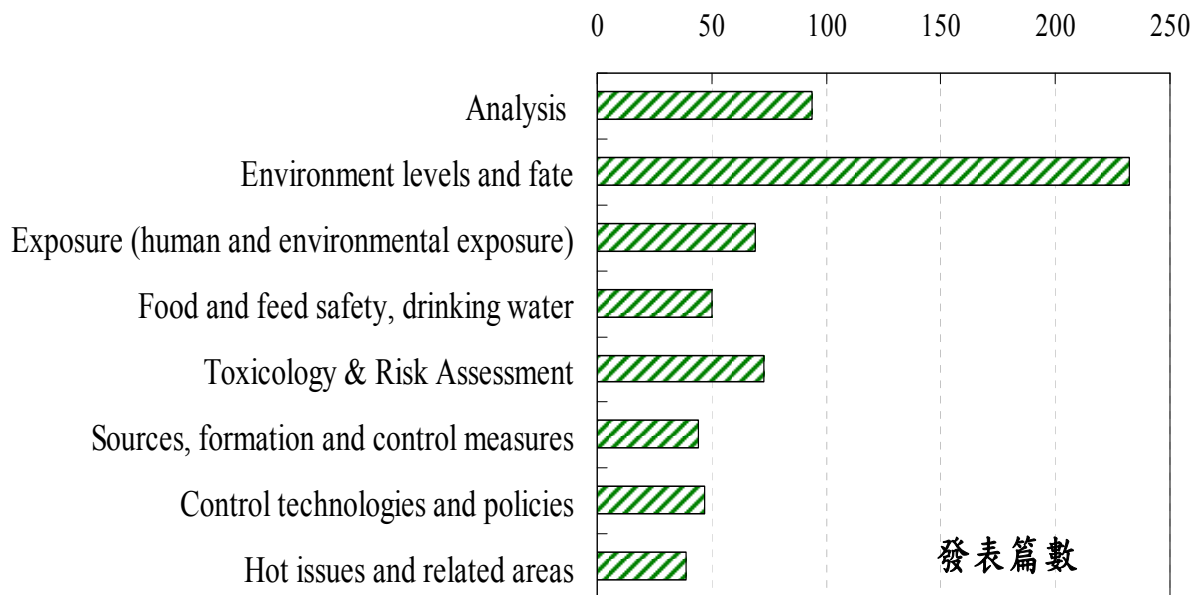
本屆會議共有來自四十多個國家八百多位專家學者與會，計發表論文 700 篇(口頭宣讀論文 263 篇及壁報展示論文 437 篇，實際收錄於本屆 2009 Organohalogen Compounds 刊物之全文計有 656 篇)。

研討會論文發表包括口頭論文宣讀及壁報論文展示，論文宣讀分別於 5 個場地同時進行，論文宣讀方式以 Power Point 簡報軟體進行 15 分鐘簡報後，接受 5 分鐘提問；壁報論文展示期間為 24 日至 27 日下午，大會並安排 24 日及 25 日兩個時段作者必須於展示會場接受提問討論，壁報展示會場的相鄰場地為儀器展示會場，本次參展的儀器廠商計有 27-30 家，包括有提供分析儀器、前處理裝置、標準品供應、快速篩檢技術等廠商及公司。

研討會於 8 月 23 日接受報到及註冊；而 8 月 24 至 27 日是論文展示及演講發表時間，會議議程如 (附件一)；會議於 8 月 28 日中午結束，明年(2010 年)的研討會會議預計於 9 月 12-17 日於美國德州聖安東尼舉行。

三、心得

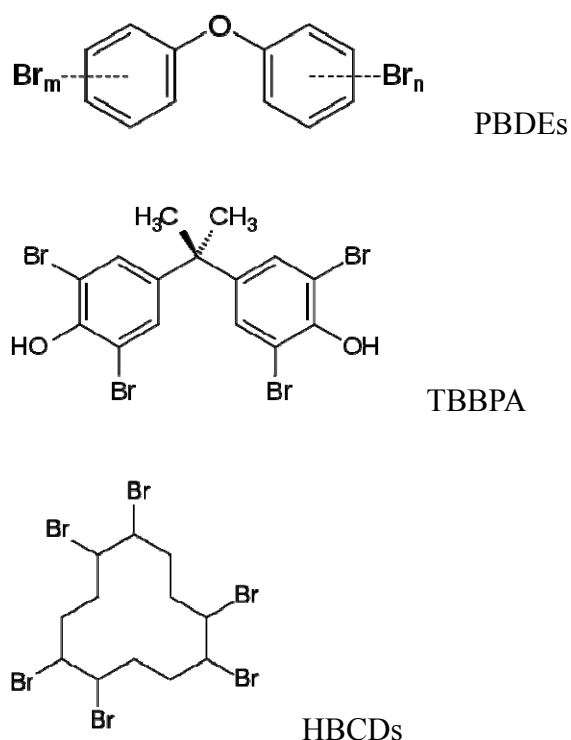
本次研討會主題探討含鹵素持久性有機污染物的分析(Analysis)、環境的含量及流佈情形(Environment levels and fate)、人體及環境的暴露情形(Exposure-human and environmental exposure)、食品－飼料安全及飲用水(Food and feed safety, drinking water)、毒理及暴露評估(Toxicology & Risk Assessment)、來源－形成及控制措施(Sources, formation and control measures)、控制技術及政策(Control technologies and policies)、熱點問題及相關領域(Hot issues and related areas)等共八大主題，各主題下另細分有 4~8 項子題，在刊登發表的論文中，以探討 POPs 在「環境的含量及流佈情形」的主題所發表的相關論文篇數最多，其次為探討 POPs 的「分析」主題，見 (圖二)。我國研究人員在本次會議中發表 17 篇研究論文，其論文題目及所屬主題見 (附件二)，本所研究團隊發表之論文見 (附件三) 及 (圖四)。此次與會為本所研究人員第一次參與持久性有機污染物的年度國際研討會，在眾多的議題中有幾項重點與本所研究工作及本會相關業務有較直接之關連，茲將相關議題之心得分述如下：



圖二、研討會相關主題的論文發表篇數

溴化阻燃劑的研究探討及分析調查

本次研討會所探討的持久性有機污染物(POPs)種類包括戴奧辛(PCDDs)、呋喃(PCDFs)、多氯聯苯(PCBs)、多環芳香烴化合物(PAHs)、溴化阻燃劑類化合物(Brominated Flame Retardants)、全氟化物(PFCs, perfluoroalkyl chemicals)及有機氯農藥(OCPs)等,其中以溴化阻燃劑類化合物的相關研究論文篇數最多,所謂溴化阻燃劑類化合物種類(圖三)包括多溴聯苯醚化合物(poly-brominated diphenyl ethers, PBDEs)、四溴雙酚 A (tetrabromobisphenol A, TBBPA)及六溴環十二烷(hexabromo-cyclododecanes, HBCDs)等,有關溴化阻燃劑類化合物的分析、在環境的含量及流佈情形、在人體及環境的暴露情形相關論文發表計上百篇。



圖三、溴化阻燃劑-多溴聯苯醚化合物、四溴雙酚 A 化合物及六溴環十二烷化合物之結構。

由於阻燃劑除可預防燃燒外,當火災發生時,阻燃劑也可以防止火焰擴散及延緩火勢蔓延的速度,而能使身陷火場的人員有較多的時間適時疏散逃生,因而被廣泛應用於各類的電器及電子產品、家用產品、紡織品、塑膠及建材等物料等。阻燃劑包括有溴系、氯系、氮系磷系及無機阻燃劑等五類,其中以溴系阻燃劑效

率最高，因此溴化阻燃劑在環境介質及生物體中的累積量成爲被關注之焦點；有關電器、電子產品、家電產品一旦成爲 E-waste，其本體所含的溴化阻燃劑會釋放累積於環境介質及生物中，會議所發表的論文包括探討分析空氣、室內灰塵 (house dust)、地面水、河川底泥、土壤、污泥、鳥類、魚體、哺乳動物(如鯨、豚、海豹)、血液及牛乳中溴化阻燃劑的含量，此外，這些 E-waste 一旦發生焚燒，也可能產生溴化戴奧辛/呋喃(PBDD/PBDF)，散佈於環境中同樣難以分解並造成環境蓄積及生物累積。對於溴化阻燃劑或者溴化戴奧辛/呋喃累積於生物體後，可能造成的生物累積效應資料仍不夠完整，也成爲各國專家學者積極探討及掌握的毒理及暴露量評估課題；美國學者調查各類食物中的 PBDEs 及 HBCDs，以魚體中累積量較高，魚肉中的 PBDEs 含量爲 50-450 pg/g w.w.；中國大陸的學者進行中國北方(天津市)及南方(福建省)人體血液中的 PBDEs 調查顯示，天津市人體血清樣品(serium)中 total PBDEs 的濃度範圍爲 0.48-1980 ng/g lipid，其 median value 爲 7.1 ng/g lipid，而福建省人體血漿樣品(plasma)中 total PBDEs 的濃度範圍爲 1.0-4.3 ng/g lipid，其 median value 爲 2.5 ng/g lipid。日本學者的田間調查顯示環境中 PBDDs 及 PBDFs 釋放源爲生產 flame retarded plastic 的工廠和生產 flame retardants 工廠所排放的氣體，在這些工廠的放流水中的也可分析到 PBDDs/DFs。

在本次研討會中也提及到已開發國家的 E-waste 大量非法的進口到亞洲開發中國家囤積所造成當地嚴重的環境污染問題，日本 Ehime University 的學者分別與越南及菲律賓的學者探討在越南和菲律賓國內 E-waste 回收場及傾倒場的 house dust 所含的 PBDEs 及 HBCDs 的含量，發現在越南的 E-waste 回收場的 house dust 中所含的 PBDEs 含量範圍爲 110-10000ng/g，遠高於對照區的 36-260ng/g，PBDEs 的種類以 BDE209 所佔比例最高；而 HBCDs 的含量爲對照區(median 8.7 ng/g)的 3 倍及 7 倍，以 α -HBCD 所佔比例最高；在菲律賓的 E-waste 傾倒場 house dust 所測得 PBDEs 平均量爲 665 ng/g dust，而 HBCDs 的平均量 22 ng/g dust，所分析得到的 PBDEs 及 HBCDs 種類，同樣以 BDE209 及 α -HBCD 所佔比例高。

荷蘭學者利用 DR CALUX 檢測飼料添加物-氯化膽鹼(cholin chloride)發現有部分樣品的篩檢結果出現偏高的情形，利用 HRGC-MS 分析並未發現戴奧辛及

PCBs 污染的情形，進一步利用 GC-TOFMS 分析後發現有溴化阻燃劑存在，包括 PBDEs 、 2,4,6-Tribromofenol 以及一種新的溴化阻燃劑 Octabromo-1,3,3-trimethylphenyl-1-indan(FR-1808, OBIND)，這些溴化阻燃劑存在飼料添加物-氯化膽鹼中，是導致 DR CALUX 篩檢結果偏高的原因。

我國環境保護署環境檢驗所的研究人員在本次研討會發表 3 篇論文，在有關分析方法開發的論文-「An efficient and green cleanup system for analysis of Dioxin/Furans, dioxin-like PCBs and PBDEs」之中，利用 CAPE 公司的酸性矽膠活性碳複合管柱開發出有效率且兼具環保的戴奧辛、多氯聯苯及多溴聯苯醚化合物的萃取淨化方法，由於過去 CAPE 是應用在戴奧辛免疫法檢測的前處理步驟，在環檢所將其引進作為 PCDD/Fs 及 dl-PCBs 的檢測前處理程序後，獲得不錯的效果，繼 2007 年於東京戴奧辛年會發表其在環境水質、飛灰、底泥的測試結果後，陸續完成生物樣品的檢測，並納入多溴聯苯醚的分析，其空白基質的偵測濃度，在 24 種 PBDE 中（3 溴至 10 溴）範圍由 0.483 至 1.39ng/column.，而且主要的偵測物種為 BDE-47、BDE-209 及 BDE-99，而 PBDE 總量的方法偵測極限(MDL)為 4.47ng/g，自去年（2008）迄今，已進行 64 種不同環境介質的真實樣品分析，回收率在 13C12-PCDD/Fs 為 65.7 %-103 %，13C12-PCBs 為 52.5%-81.8%，以及 13C12-PBDEs 為 36.7 %-106 %，三項結果皆符合美國環保署方法規範 M1613B、M1668A 及 M1614，與傳統淨化方法、Power-Prep 自動淨化系統比較下，不但節省分析成本花費、降低樣品前處理時間更減少的溶劑使用量達 2.5-5 倍，本篇文章被邀請於會議期間進行 oral presentation 引起其他國家研究人員之關注詢問；此外，在環檢所的另一篇發表文章「Levels of PCDDs, PCDFs, dioxin-like PCBs, and PBDEs in fish samples from rivers and estuaries in Taiwan」中則利用上述所開發的方法調查台灣河流及入海口魚類體中的戴奧辛、PCBs 及 PBDEs 的含量，結果顯示 PCDDs/PCDFs 和 dl-PCBs 的含量分別為 0.024 ~ 1.02 pg WHO-TEQ/g wet weight 及 0.023 ~ 14.1 pg WHO-TEQ/g wet weight，而 PBDEs 的濃度含量為 12.1 ~ 380 ng/g lipid weight；根據我國「持久性有機污染物斯德哥爾摩公約國家實施計畫」內容顯示，衛生署衛生署自 2006 年起陸續針對市售乳製品、肉類(豬、牛、羊、雞、鵝及鴨)及魚貝類進行 PBDEs 殘留量調查，檢驗結果皆有檢出 PBDEs 的存在。

飼料中持久性有機污染物的監控

大會邀請的 keynote speaker 德國學者 Peter Fürst 進行專題演講，在其發表中回顧過去 10 年發生的重大戴奧辛污染食物事件如（表一）：

表一、重大戴奧辛污染事件列表

| 年份 | 重大戴奧辛污染事件 |
|------|---|
| 1998 | Brazilian citrus pulp pellets |
| 1999 | Belgian PCB/dioxin incident |
| 1999 | Caolinitic clay as anti-caking agent |
| 2000 | Drying of grass meal |
| 2002 | "Carbosan copper" as feed additive |
| 2004 | Caolinitic clay in potato pulp |
| 2005 | Hydrochloric acid for gelatine production |
| 2007 | Guar gum from India |
| 2008 | Italian buffalo mozzarella |
| 2008 | zinc oxide in Chilean pork |
| 2008 | Irish pork |

追蹤原因後發現，主要由於遭戴奧辛污染的草料(forage)、飼料添加物或原料所製成的飼料被動物食用累積，導致禽、畜、水產品的戴奧辛污染事件；因此，針對飼料中持久性有機污染物含量的更嚴格監控及標準的訂定是重要的課題，2008 年義大利的乳酪戴奧辛污染事件、愛爾蘭及智利的豬肉戴奧辛污染事件，其中以愛爾蘭豬肉戴奧辛污染事件所影響的國家最多，對愛爾蘭國內經濟的衝擊也最大，該豬肉戴奧辛污染事件發生的原因是由於做為飼料原料的生麵包團(raw baker's dough)在烘乾過程中被戴奧辛污染所導致，而智利的豬肉戴奧辛污染事件則是由於添加於飼料的氧化鋅(zinc oxide)被戴奧辛污染所導致，義大利的乳酪戴奧辛污染事件與製造乳酪的水牛牛奶受戴奧辛污染所致，對於造成牛奶污染的原因並未確切指明，但推測生產牛奶的牛隻食用的草料(forage)可能受戴奧辛污染，在本次研討會三個事件發生國皆由該國政府單位或相關研究機構提出報告和與會研究人員共同交換經驗，包括探討事件發生的始末、事件發生對食品安全及

經濟衝擊的危機處理、事件發生過後的檢討補救措施及控管策略。

藥毒所(本所)戴奧辛團隊在本次研討會中發表論文「Determination of PCDDs/DFs and dioxin-like PCBs in egg and fish feed samples in Taiwan by the DR CALUX[®] Bioassay」，利用 DR CALUX[®]生物快速篩檢法進行鰻魚(eel)、鱸魚(seabass)及吳郭魚(tilapia)養殖飼料進行戴奧辛及多氯聯苯的篩檢，結果顯示飼料中的戴奧辛及多氯聯苯的含量都低於歐盟限值，由於我國尚未明確訂定飼料中的戴奧辛和多氯聯苯的含量標準，因此目前仍是參考歐盟對飼料的規範為依據，如何根據國內農、水、畜的養殖狀況，針對飼料、飼料原料、飼料添加物等訂定適當戴奧辛及多氯聯苯含量限值是需積極進行的工作，此外，由於本會所需要監控的水、畜產品基質種類相當多，結合生物快速篩檢法及 HRGC/MS 化學分析法可建立有效率農、水、畜產品中戴奧辛及多氯聯苯含量監測體系。

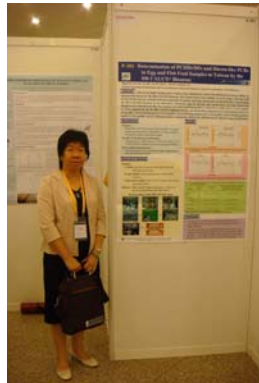
全球尺度的持久性污染物的大規模研究

在本次會議中，另一倍關注的焦點為全球尺度的環境監測工作，其目的係為化學品的健全管理提供科學依據，包括有關污染程度和趨勢、來源、暴露量和化學品管理制度的執行成效。在第一次斯德哥爾摩公約的成效評估會議中，許多締約國盡了很多努力，也支持組織機構收集環境監測數據，並建立區域/次區域的環境監測架構。同樣重要的附加角色，環境標本庫，也受到各簽約國的認同，任務在於長期儲存進行監測的樣本，以用在將來的回溯性分析。

在本次研討會中，日本與會者簡短總結日本以及亞太地區的持久性(含新興)有機污染物環境監測數據，以及其團隊針對保存於環境標本庫(Environmental Specimen Bank, ESB) - Environmental Time Capsule facility-中的生物樣品所做的分析比較。六個參與這項計畫的亞太地區國家，包含斐濟、印度、卡達、敘利亞、中國及日本，調查了空氣、母乳、血液、水、土壤、底泥及生物群，而透過 ESB 的分析則得出幾項訊息，持久性有機污染物中的戴奧辛、可氯丹(Chlordane)、毒殺芬(toxaphene)及六氯環己烷(HCHs)在北太平洋的分佈格局反映出它們的化學特性及其污染源，遷移和宿命。經由雙殼貝類體內的微量分析，調查日本海岸沿線的持久性有機農藥、六氯環己烷、全氟辛烷磺酸 (PFOS)以及具有羧基端的全氟化物(PFCs)：如 PFOA (C8) ~ PFdDA (C12)在水域的分布，發現幾個水域污染熱點；另外以蜻蜓作為新的生物監測，調查日本陸地的全氟化物含量水平，一般而言，無論在都市或鄉下其體內含量濃度皆高於人體，有趣的是，幾個陸地上的污染熱點，恰好都鄰近水域污染熱點；類似這類以生物監測作為水域及陸地環境污染物的分布研究，可做為將來本所進行農業環境監測的參考，由於農產品包含作物、水產及畜產等多樣生物物種，藉由合適的生物監測物種，可廣泛地獲得目標污染物在農業生產環境中的分布，以作為農政單位施政的科學依據。

此外，在探討污染物的轉移及變遷的議題上，加拿大多倫多大學的 Frank Wania 教授進行了全球規模尺度的冷捕集(cold-trapping)研究，已知持久性有機污染物(POPs)會經由大氣層長距離的飄流後沉積在遠處，間接影響當地的野生動物與居民。在高緯度和高海拔中，溫度梯度及其對氣相/沉積相(gas phase/condensed phase)的分配比例，對有機污染物的沉積，扮演很重要的作用，在納木錯湖測站

所測得的多氯聯苯和溴化阻燃劑濃度甚低，並未顯示明顯的季節變化，不過也反映了較實際的全球背景污染值，也表示這類工業污染物，不若有機氯農藥有較明顯的區域性來源；由於全球性的有機污染調查，需要世界各地的研究機構參與，他呼籲有興趣的單位參加評選，以長期合作調查。



圖四、壁報論文展示現場一隅。

四、建議事項

1. 關於食物中戴奧辛(PCDDs/DFs)及類戴奧辛多氯聯苯(dl-PCBs)的限量標準在歐盟、美、日等重要經濟體皆已制訂定，但我國仍以衛生署在 2006 年訂定的「食品中戴奧辛處理規範」中所規定戴奧辛含量的最大限量為依據，並未考慮 dl-PCBs 的貢獻量，由於 dl-PCBs 在水產品中的含量較高，而水產品除為國人重要的食物源之外，更是本會重要的出口產品，因此建議本會(農委會)與衛生署、環保署參考歐盟規範(Commission Regulation (EC) No 199/2006)共同商討增訂各類食品中 dl-PCBs 的限量標準。
2. 本會為各類飼料品質的主管機關，而飼料的品質攸關禽、水、畜產品的安全，我國尚未明確訂定飼料中的戴奧辛和多氯聯苯的含量標準，因此如何根據國內農、水、畜的養殖狀況，針對飼料、飼料原料、飼料添加物等訂定適當戴奧辛及多氯聯苯含量限值為需要積極進行的重點工作。
3. 積極規劃執行農、水、畜產品中戴奧辛含量的監測調查，以掌握各類產品的戴奧辛背景含量，並針對戴奧辛污染源周邊的農、水、畜耕種及養殖區域加強追蹤及產品品質控管。
4. 我國環保署及衛生署已針對環境介質及食品所累積的溴化阻燃劑含量進行初步調查分析，本會宜積極加快相關研究工作的推動及執行。
5. 我國環保署環檢所自 1995 年起(民國 84 年)積極參與持久性有機污染物國際研討會，並發表論文，其研究成果不但獲得國際肯定且給與政府所屬研究單位及學術單位相關的經驗技術支援及協助，可為本所相關研究同仁學習模範。
6. 此次與會為本所研究人員第一次參與持久性有機污染物的年度國際研討會，除註冊費為公費，其餘交通費及生活費皆由個人自行支付。參加國際研討會除可增加相關研究領域之專業知識並可與國際同領域之研究人員互動，獲益頗多，惟自費參加國際研討會，實屬不小之負擔，農委會宜有專案經費鼓勵研究人員參加國際研討會，增加與國際間之互動及聯絡管道。

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Monday August 24

| 09:00-10:00 | | Convention Hall 1 | | |
|-------------|---|---|---|---|
| | Welcome Address Opening Ceremony | | | |
| 10:00-10:40 | Coffee Break | Exhibition Hall | | |
| 10:40-12:10 | Plenary Session 1 | Convention Hall 1 | | |
| | Listing of Emerging Organic Contaminants Into the Stockholm Convention: Research Progress, Challenges and Future Perspectives in China - Guibin Jiang, Research Center for Eco-Environmental Sciences, CAS, China | | | |
| | Cold Trapping of Persistent Organic Pollutants in the Himalayas and on the Qinghai-Tibetan Plateau - Frank Wania, University of Toronto Scarborough, Canada | | | |
| 12:10-13:00 | Lunch (Buffet at Banquet Hall, Continental Grand Hotel) | | | |
| 13:00-14:00 | Poster Session 1 | Exhibition Hall | (P001-200 Require to be in Attendance) | |
| | Room 201-ABC | Meeting Room 305-ABC | Convention Hall 2A | Convention Hall 2C |
| 14:00-15:40 | Remediation & Elimination | BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation | POPs in Marine Mammals: Levels, Effects, Trends | Laboratory and Field Studies of Formation and Sources |
| 15:40-16:10 | Coffee Break | Exhibition Hall | | |
| 16:10-17:50 | Industrial, Occupational, and Indoor Exposure | BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation | High Speed Bioassay, Screening Techniques and Methods | POPs Monitoring in Polar Areas and High Plateau |
| 19:00-21:00 | Welcome Reception Convention Hall 1 | | | |

Monday August 24

9:00 Opening Ceremony **Convention Hall 1**
Welcome Address

10:00 Coffee Break **Exhibition Hall**

10:40 Plenary Session 1 **Convention Hall 1**

Chairs: Heidelore Fiedler, Zhifang Chai

10:40 Listing of Emerging Organic Contaminants Into the Stockholm Convention: Research Progress, Challenges and Future Perspectives in China
Guibin Jiang, Research Center for Eco-Environmental Sciences, CAS, China

11:25 Cold Trapping of Persistent Organic Pollutants in the Himalayas and on the Qinghai-Tibetan Plateau
Frank Wania *A10763*
University of Toronto Scarborough, Canada

12:10 Lunch (Buffet at Banquet Hall, Continental Grand Hotel)

13:00 Poster Session 1 **Exhibition Hall**

Presenting Authors with number P(001-200) require to be in attendance

Remediation & Elimination **Room 201-ABC**

Chairs: Jerald L. Schnoor, Chih C. Chao

14:00 Reductive Dechlorination of Polychlorinated Biphenyl by an Anaerobic Sediment-Free Culture
Jianzhong He *A10345*

14:20 Promotive Excretion of Polychlorinated Dibenzofurans and Polychlorinated Dibenzo-*p*-Dioxins by FBRA in Patients with Yusho
Junya Nagayama *A10108*

14:40 Enrichment of Anaerobic Bio-Dechlorination Activity of Chlorinated Aromatics from Paddy Soil for Bioremediation Technology
Arata Katayama *A10699*

15:00 Fenton-like Oxidation of Trichloroethylene in the Presence of Natural Pyrite
Hyeongsu Che *A10092*

15:20 Degradation of PBDE by Lignin Peroxidase from White Rot Fungi
Yijun Chen *A10620*

Industrial, Occupational, and Indoor Exposure **Room 201-ABC**

Chairs: Jochen Mueller, Aiqian Zhang

16:10 A Temporal Trend Study of Human Exposure to Fluorinated Ski Wax
Helena Nilsson *A10286*

16:30 Levels of Polychlorinated Biphenyls, Brominated Flame Retardants and Dioxin-like Activities Associated with E-Waste Recycling in Vietnamese House Dust
Tue Nguyen Minh *A10099*

16:50 Brominated Flame Retardants in House Dust from the Philippines: Levels, Profiles and Fate
Malarvannan Govindan *A10115*

17:10 Airborne Concentrations of Polybrominated Diphenyl Ethers in Private Cars
Sadegh Hazrati *A10646*

17:30 Emission Rate of Hexabromocyclododecane (HBCD) from the Surface of A Flame Retarded Curtain in Japan
Yuichi Miyake *A10193*

BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation

Room
305-ABC

Chairs: Gary Hunt, Jingwen Chen

- 14:00** Methoxylated and Hydroxylated Polybrominated Diphenyl Ethers in Brown Bullhead (*Ameiurus Nebulosus*) Plasma from Lake Ontario
Adrián de la Torre A10498
- 14:20** Polybrominated Diphenyl Ethers in the Environment of E-Waste Recycling
Qian Luo A10723
- 14:40** Debrominated and Hydroxylated Metabolites of Individual Polybrominated Diphenyl Ethers (PBDEs) in Juvenile Common Sole (*Solea Solea*)
Catherine Munsch A10037
- 15:00** Particle-Bound Dechlorane Plus in the Atmosphere of Harbin, China
Wanli Ma A10053
- 15:20** Occurrences of Perfluorinated Compounds in Eastern Thailand
Chinagam Kunacheva A10059

BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation

Room
305-ABC

Chairs: An Li, Yeru Huang

- 16:10** Fluxes of Perfluorinated Chemicals through Precipitation in Japan, USA and Several Other Countries
Karen Kwok Ying A10299
- 16:30** Concentration Profiles of Perfluorinated Organic Compounds in Groundwater Bodies Influenced by Rainwater or Infiltrated River Water in the Netherlands
Pim de Voogt A10146
- 16:50** PBDEs and HBCD in Sewage Sludge and River Sediments in the Czech Republic: A 3-Year Survey (2006–2008)
Monika Stavelova A10164
- 17:10** Time Trends of Perfluorinated Compounds in the Sediment Core of Tokyo Bay, Japan (1950s-2004)
Yasuyuki Zushi A10190
- 17:30** Exposure of California Peregrine Falcon (*Falco peregrinus*) to BFRs (PBDEs and New Alternatives) and PCBs: Different Profiles of PBDEs, Prey, and Isotope Patterns Between Coastal and Big City Nesting Birds
June-Soo Park A10205

POPs in Marine Mammals: Levels, Effects, Trends

Convention
Hall 2A

Chairs: Shinsuke Tanabe, Susan D. Shaw

- 14:00** Hexabromocyclododecanes, Polybrominated Diphenyl Ethers and New Organobrominated Compounds in Marine Mammals from Hong Kong, China
James Lam A10273
- 14:20** Specific Accumulation of Polybrominated Diphenyl Ethers Including Deca-BDE in Tissues of Harbor Seals from the Northwest Atlantic
Susan D. Shaw A10597
- 14:40** Comprehensive Study on Hydroxylated Polychlorinated Biphenyls in the Blood of Cetaceans, Including Toothed Whales and Baleen Whales Stranded at the Japanese Coast
Kei Nomiya A10019
- 15:00** A Lifetime Physiologically Based Pharmacokinetic Model for CB 153 in Harbour Porpoises: in Silico Tool for Predicting Concentrations of Future Lipophilic Pollutants?
Liesbeth Weijs A10334
- 15:20** A Twenty Year (1987-2007) Trend of PBDEs in Beluga
Michel Lebeuf A10100

High Speed Bioassay, Screening Techniques and Methods

Convention
Hall 2A

Chairs: Bin Zhao, Haowen Yin

- 16:10** Species-Specific Third Generation (G3) Luciferase Cell Bioassays Show Dramatically Increased Sensitivity and Magnitude of Response to TCDD and Other Ah Receptor Agonists
Guochun He A10567
- 16:30** Bioassay Directed Detection of Brominated Dioxins in the Feed Additive Cholin Chloride
Wim Traag A10516
- 16:50** Usage of DR Calux Method in Crisis Situation Ana National Monitoring Programs: Experiences in Different Countries with Different Food and Feed Matrices
Peter A. Behnisch A10234
- 17:10** Applicability of the TH Promoter Activation Assay (TH Assay) for Screening of Dioxin-like Compounds
Saeko Uruno A10017
- 17:30** Robustness of the Calux Bioassay: Statistical Analysis of the Between-Well Variability for the H116.1c3 Mouse Hepatoma Cell Line
Kim Croes A10149

Monday August 24

Laboratory and Field Studies of Formation and Sources Convention Hall 2B

Chairs: Gerhard Thanner, Pingan Peng

- 14:00** Source Inventories of HCB and PCB and Uncertainty of Their Air Emission Factors
Shin-ichi Sakai A10259
- 14:20** PCDDs/DFs and PBDDs/DFs Emissions from Crematory
Masaki Takaoka A10211
- 14:40** Assessing Pesticides as a Source of Dioxins to the Australian Environment
Eva Holt A10078
- 15:00** Dioxin and Furan Emission Evaluation in Automotive Diesel Engines
Joao Vicente De Assuncao A10144
- 15:20** Sources of Dioxins to the Baltic Sea - Identification and Apportionment Using Pattern Analysis and Receptor Modeling
Kristina L. Sundqvist A10180

Laboratory and Field Studies of Formation and Sources Convention Hall 2B

Chairs: Ute Karl, Honghai Tian

- 16:10** Evaluation of PBDD/Fs and PCDD/Fs Emissions from Metallurgical Processes
Bing Du A10373
- 16:30** Current Status of Polybrominated Dibenzo-*p*-Dioxins and Furans (PBDD/DFs) Emissions in Japan
Shizuko Ota A10313
- 16:50** Effect of Temperature and Oxygen on the Formation of PCDD/Fs Surrogate
Mi Yan A10338
- 17:10** Effect of Chloride on the Formation of Polychlorinated Dibenzo-*p*-Dioxins During Phototransformation of Pentachlorophenol
Xie Quan A10446
- 17:30** The Fingerprint of Chlorinated Aromatic Compounds in Contaminated Sites from Chloralkali Processes and A Historic Chlorine Production Using GC-HR-TOF-MS Screening
Roland Weber A10522

Food Contamination Sources and Transport Convention Hall 2C

Chairs: Peter Fürst, Yongning Wu

- 14:00** Influence of Dioxin Contaminated Feed and Its Effect Upon the Content in Adipose Tissue of Pigs
Karl-Werner Schramm A10186
- 14:20** Dioxin Contamination of Chilean Pork from Zinc Oxide in Feed
MeeKyung Kim A10045
- 14:40** Enantioselectivity in Environmental Safety of Chiral Halogen-Containing Insecticides
Weiping Liu A10577
- 15:00** PFOS, PFOA and Other Fluorinated Organic Chemicals in Food
David Mortimer A10317
- 15:20** Polybrominated Diphenyl Ethers, Organochlorine Pesticides, Polychlorinated Biphenyls and Perfluorinated Compounds in Composite Samples of United States Food
Arnold Schecter A10236

POPs Monitoring in Polar Areas and High Plateau Convention Hall 2C

Chairs: Frank Wania, Karl-Werner Schramm

- 16:10** Observation of POPs in Tibetan Plateau
Tong Zhu
- 16:30** History Repeats Itself: Persistent Organic Pollutants in the Glacier-Fed Lake Oberaar, Switzerland
Christian Bogdal A10087
- 16:50** Persistent Organic Pollutants in Feathers and Blood from Nestling Raptors of Northern Norway: Differences Among Species and Relation to Stable Isotopes
Veerle Jaspers A10251
- 17:10** Altitude Dependence of Polychlorinated Biphenyls (PCBs) and Polybrominated Diphenyl Ethers (PBDEs) in Surface Soil from Tibetan Plateau, China
Pu Wang A10425
- 17:30** Persistent Organic Pollutants in the Atmosphere of the Mountains of Western Sichuan, China
Xiande Liu A10542
- 19:00** Welcome Reception at Convention Hall 1, BICC. Please wear your name badge and take the ticket.

Tuesday August 25

| 08:45-09:30 Plenary Session 2 Convention Hall 1 | | | | | |
|---|--|---|---|---|---|
| Biological and Toxicological Consequences of Ah Receptor Activation: Just How Complicated Can One Receptor Get? - Michael S. Denison, University of California, USA | | | | | |
| 09:30-10:00 Coffee Break Exhibition Hall | | | | | |
| Room201-ABC | | Room305-ABC | | Convention Hall 2A | Convention Hall 2C |
| Environmental Policy and Management | | BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation | | Temporal and Spatial Trends of POPs | POPs in Humans (Pattern, Levels and Trends) |
| 10:00-12:20 | | | | | |
| Environmental Policy and Management | | | | | |
| 12:20-13:00 Lunch (Buffet at Banquet Hall, Continental Grand Hotel) | | | | | |
| 13:00-14:00 Poster Session 2 Exhibition Hall (P201-437 Require to be in Attendance) | | | | | |
| Room201-A | Room201-BC | Room305-ABC | Convention Hall 2A | Convention Hall 2B | Convention Hall 2C |
| POPs in Soil and Sediments (Levels and Processes) | Asia (Vietnam et al.) and other Regional Contamination of Dioxins and POPs | BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation | Integrating Toxicology and Epidemiology for Risk Assessment | Sample Preparation and Clean up | POPs in Humans (Pattern, Levels and Trends) |
| 14:00-15:20 | | | | | |
| POPs in Soil and Sediments | | | | | |
| 15:20-15:50 Coffee Break Exhibition Hall | | | | | |
| Room201-ABC | | Room305-ABC | | Convention Hall 2A | Convention Hall 2C |
| POPs in soil and sediments | | BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation | | Integrating Toxicology and Epidemiology for Risk Assessment | POPs in Humans (Pattern, Levels and Trends) |
| 15:50-17:30 | | | | | |
| POPs in soil and sediments | | | | | |
| Asia (Vietnam et al.) and other Regional Contamination of Cloxins and POPs | | | | | |
| Environmental Exposure of POPs | | | | | |
| Integrating Toxicology and Epidemiology for Risk Assessment | | | | | |
| POPs in Humans (Pattern, Levels and Trends) | | | | | |

Tuesday August 25

8:45 Plenary Session 2 Convention Hall 1

Chairs: Martin Van den Berg, Zhixiong Zhuang

8:45 Biological and Toxicological Consequences of Ah Receptor Activation: Just How Complicated Can One Receptor Get?
Michael S. Denison A10761
University of California, USA

9:30 Coffee Break Exhibition Hall

Environmental Policy and Management Room 201-ABC

Chairs: Heidelore Fiedler, Xiaoling Yang

10:00 The Needs of Listing New POPs For Developing Countries
Jianxin Hu A10754

10:20 Study on Countermeasures For Emission Reduction of PFDD/PCDFs under the Framework of Implementation of POPs Convention in China
Yang Chen

10:40 Simultaneous Reduction of Dioxins and Carbon Dioxide in Fossil fuel-fired Power Station
Carmela R. Centeno

11:00 Benefits and Trade-Offs Between Reductions of Greenhouse Gases and Unintentionally Produced Persistent Organic Pollutants
Ute Karl A10355

11:20 Cost-Benefit Analysis of Environmental Sound Management Project for Obsolete POPs Stockpile and Associated Wastes in China
Jianxin Zhu A10131

11:40 Assessment of the Technology Needs on POPs Reduction and Disposal
Q. Ding

12:00 Flame Retardants, Health, and Environment: How Peer-Reviewed Science Can Impact Regulatory Decision-Making
Arlene Blum A10545

12:20 Lunch (Buffet at Banquet Hall, Continental Grand Hotel)

13:00 Poster Session 2 Exhibition Hall

Presenting Authors with number P(201-437) require to be in attendance.

BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation Room 305-ABC

Chairs: Heinrich Hühnerfuss, Stuart Harrad

10:00 Bioaccumulation of β - and γ -Hexabromocyclododecane in Lower Aquatic Food Web
Sami Huhtala A10596

10:20 Partitioning Behaviour and Trophic Transfer of Perfluorinated Compounds in Hong Kong Mai Po Tidal Shrimp Ponds, China
Eva I Ha LOI A10264

10:40 Concentrations of PBDEs, HBCDs, TBBP-A, PAH, and PCBs in English Lake Water: First Report from the Opal Project
Stuart Harrad A10170

11:00 Assessment of Brominated Flame Retardants in Fish from Asian Countries: Levels, Distribution, Profiles and Health Risk
Agus Sudaryanto A10267

11:20 High Prevalence of BDE 209 and Other High Brominated Diphenyl Ethers in White Storks (*Ciconia Ciconia*) from Two Areas of Spain
Juan Munoz-Arnanz A10290

11:40 PBDEs and HBCDs in Flemish Eels: Levels and Isomeric Patterns
Laurence Roosens A10293

12:00 Spatial and Vertical Distribution of Brominated Flame Retardants in Sediments from Manila Bay, the Philippines
Tomohiko Isobe A10322

Tuesday August 25

Temporal and Spatial Trends of POPs

Convention Hall 2A

Chairs: Bommana Loganathan, Paul K.S. Lam

- 10:00** Dioxins and Other POPs in the Baltic Sea – Trends and Current Status
Karin Wiberg A10223
- 10:20** Temporal Trends of Polybrominated Diphenyl Ethers and Hexabromocyclododecane in Swedish Peregrine Falcon (*Falco Peregrinus*) Eggs
Anna-Karin Johansson A10481
- 10:40** Thirty Year Monitoring of PCBs and Organochlorine Pesticides in Eel from the Netherlands
Jacob de Boer A10314
- 11:00** Regional Versus Local Variations of DDTs, HCHs, HCB, Chlordanes and Endosulfans in the
Paromita Chakraborty A10311
- 11:20** Study on Natural Formation of Dioxins: Dioxins in Kaolin Clays from Asia and Several Other
Yuichi Horii A10588
- 11:40** Spatial and Temporal Trends of Persistent Toxic Substances in India
Annamalai Subramanian A10166
- 12:00** Modeling the Effects of a Climate Change Scenario on the Distribution of Organic Pollutants
Antonio Marcomini A10137

New Instrumental Techniques for POPs Analysis

Convention Hall 2B

Chairs: Eric Reiner, Jianwen She

- 10:00** High Through-Put Mass Spectrometry, Laboratory Automation
Jianwen She A10513
- 10:20** Analysis of Highly Chlorinated Dibenzofurans Using Gas Chromatography/Multiphoton Ionization/Time-of-Flight Mass Spectrometry
Yuka Watanabe-Ezoe A10070
- 10:40** The Use of Combined High Volume Injection/ Dual Data Acquisition to Reduce the Analysis Time of Polychlorinated Dibenzo-*p*-Dioxins and Polychlorinated Dibenzofurans
Chuck Sueper A10145
- 11:00** Measurement of Triclosan and Pentachlorophenol in Serum from the Historic Cohort of California Women (1960s, 1980s, 2000s): A Pilot Study
June-Soo Park A10241
- 11:20** Evaluation of GC-HR-TOFMS Techniques Applied For Environmental Analysis
Takumi Takasuga A10450
- 11:40** GCXGC Coupled to Fast Scanning Quadrupole MS for Trace Analysis of POPs
J. F. Focant A10587
- 12:00** An Improved Derivatization Method with N,O-Bis(trimethylsilyl)trifluoroacetamide (BSTFA) for Simultaneous Determination of Steroid Estrogens by Gas Chromatography-Mass Spectrometry
Xuejun Pan A10665

POPs in Humans (Pattern, Levels and Trends) Convention Hall 2C

Chairs: Larry Needham, Chunxia Wang

- 10:00** Reference Ranges For PCDDs, PCDFs, PCBs, Persistent Pesticides, and PCNs for the U.S. Population 2003-2004
Donald Patterson A10725
- 10:20** Preliminary Exposure Assessment of Lindane in the General Population of Ghana
Sam Adu-Kumi A10549
- 10:40** Halogenated Persistent Organic Pollutants in Human Blood Plasma from Sanming, Southeastern China
Qiuquan Wang A10123
- 11:00** Brominated Flame Retardants in Serum from General Population in North China
Lingyan Zhu A10129
- 11:20** Concentrations of Dioxin-like Compounds in the U.S. Population: an Evaluation of Data Trends and the Effects of Demographic Characteristics on Referent Total TEQ Levels
Laura Scott A10154
- 11:40** Time Trends of Persistent Chemicals in Humans – Quantifying Exposure Trends and Elimination Half-Lives from Population Biomonitoring Data
Roland Ritter A10156
- 12:00** Persistent Organochlorine Pollutants: A Risk Factor for Type 2 Diabetes
Anna Rignell-Hydbom A10187

POPs in Soil and Sediments (Levels and Processes) Room 201-A

Chairs: Xiangdong Li, Dongxing Yuan

- 14:00** Levels and Mass Inventory of DDTs in Sediments from Fishing Harbors: the Importance of DDT-Containing Antifouling Paint to the Coastal Environment of China
Tian Lin A10038
- 14:20** Distribution of Herbicides and Pesticides (Organochlorine and Organophosphate) in Agricultural Soils from Northern India
C. S. Sharma A10051
- 14:40** HRGC/HRMS Analysis of Mirex in Soil in Liyang, China
Bin Wang A10208
- 15:00** Substantial Migration of Dioxins in Agrochemical Formulations
Sharon Grant A10661

POPs in Soil and Sediments (Levels and Processes) Room 201-A

Chairs: Stefano Raccanelli, Lizhong Zhu

- 15:50** Occurrence of PCDD/Fs in Environmental Media in the Vicinity of a Municipal Solid Waste Incinerator in Eastern China
Mengxia Xu A10343
- 16:10** Release of PCBs and PBDEs from Different Depths in Contaminated Sediments Due to Bioturbation
Sarah Josefsson A10453
- 16:30** Reevaluation of the Monitoring Data of Trans-Chlordane in Sediment of Japan to Confer and Evaluate the Effects of Different Kinds of Data Calculating Methods
Yoshitoku Yoshida A10230
- 16:50** Endocrine-Disrupting Chemicals in Waters, Suspended Particulate Materials, and Sediments of the Pearl River Delta, South China: Spatial Distribution, Flux, and Risk
Yong Ran
- 17:10** Organochlorine Pesticides in Sediment Cores from Balat – A Major Estuary of Red River, Northern Vietnam: Spatial Distribution and Depth Profiles
V. H. Pham A10568

Asia (Vietnam et al.) and other Regional Contamination of Dioxins Room 201- BC

Chairs: Takeshi Nakano, Vu Chien Thang

- 14:00** Overcoming of the Consequence of Agent Orange/ Dioxin
Vu Chien Thang A10397
- 14:20** Restoration of the War-Ravaged Environment: A Serious Challenge to Vietnam's Sustainable Development
Vo Quy A10021
- 14:40** Assessment the Environment of Area Under Spread Toxic Chemicals After War in M'drak District, Dak Lak Province and Suggestions Solutions
Nguyen Huu Ngoan A10024
- 15:00** Time-Line Observation of Environmental Impacts Scratched by Herbicide Splay During Vietnam War
Nobuhiro Sawano A10482

Asia (Vietnam et al.) and other Regional Contamination of Dioxins Room 201- BC

Chairs: Takeshi Nakano, Vu Chien Thang

- 15:50** Proteomic Analysis of Poultry Liver in Region Exposed to Dioxin at Mada District, Dongnai Province, Vietnam
Trinh Hong Thai A10026
- 16:10** Present Impact Assessment of Herbicides/Dioxin to Tri an Reservoir Environment
Luong Van Thanh A10036
- 16:30** The Environmental and Human Health Issues at the "Dioxin Hotspots" of Vietnam
Le Thi Hai Le A10058
- 16:50** Organohalogen Compounds in Yellowfin Tuna (*Thunnus Albacares*) from the Western Indian Ocean
Joao Paulo M. Torres A10452

BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation

Room
305-ABC

Chairs: YongSeok Chang, Jianxin Hu

- 14:00** Evaluation of Perfluoroalkyl Compounds in Korean Wastewater Treatments Plants
Guo Rui A10367
- 14:20** Occurrence and Distribution of Perfluoroalkyl Acids in Snow and Rain in Shenyang and Dalian, China
Wei Liu A10417
- 14:40** Occurrence of Synthetic Musk Compounds (SMCs) As Emerging Contaminants in Nakdong River Basin, Korea
Chang-Dong Seo A10433
- 15:00** Distribution of PBDEs in Surface Sediments from the Bering Sea, Chukchi Sea and Chukchi Plateau
Minggang Cai A10562

BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation

Room
305-ABC

Chairs: Hongwen Sun, Gang Yu

- 15:50** Polychlorinated Biphenyls (PCBs) and Brominated Flame Retardants (BFRs) in Surface Sediments of Surabaya City, Indonesia: A Comparison Between Rivers and Coastal Waters
Muhammad Ilyas A10604
- 16:10** The Analysis of Pharmaceuticals in Sewage and Livestock Sludge Samples
Ji-Woo Lee A10605
- 16:30** A Survey of Perfluorinated Compounds in Surface Water and Ganges River Dolphins from the Ganges River and in Other Waterbodies in India
Leo Yeung A10610
- 16:50** Polybrominated Diphenyl Ethers in Seawater Cage-Farmed Fish from Two Estuarine Bays in South China: Implications For Source Inputs and Biotransformation
Ying Guo A10664
- 17:10** Effect of Prenatal Exposure to PFOS on Gene Expression in Developing Rat Brain
Faqi Wang A10395

Integrating Toxicology and Epidemiology for Risk Assessment

Convention
Hall 2A

Chairs: Tom Muir, Paolo Mocarelli

- 14:00** Integrating Toxicology and Epidemiology for Risk Assessment
Tom Muir A10254
- 14:20** Developmental Exposure to POPs Alters the Susceptibility of the Cholinergic System – Implications for Neurodevelopmental Disorders and Diseases
Per Eriksson A10470
- 14:40** Chemical Mixtures: Validation of Weight of Evidence Predictions for Interactions
Hana Pohl A10488
- 15:00** Effects of Dioxins, PCBs and PBDEs on Immunology and Haematology in Adolescents
Marike Leijts A10228

Integrating Toxicology and Epidemiology for Risk Assessment

Convention
Hall 2A

Chairs: Tom Muir, Paolo Mocarelli

- 15:50** Toxicokinetics of the Diastereomer Specific Flame Retardant Hexabromocyclododecane (HBCD): Effect of Dose, Time, and Repeated Exposure
Linda Birnbaum A10546
- 16:10** Genomics-Based Assessment of Toxicity in Mice to Four Contaminants (2,3,7,8-TCDD, CB-153, BDE-47 and HBCD) Commonly Found in Seafood
Christer Hogstrand A10543
- 16:30** The Association Between Intrauterine Exposure to Persistent Organochlorine Pollutants and Type 1 Diabetes: A Case-Control Study
Lars Rylander A10353
- 16:50** Association Between Dioxin Concentrations in Breast Milk
Teruhiko Kido A10237
- 17:10** An Oral (Gavage) Developmental Neurotoxicity
Robert Campbell

Tuesday August 25

Sample Preparation and Clean up Convention Hall 2B

Chairs: Wolfgang Rotard, Jiping Chen

- 14:00** Formation of Polychlorinated Dibenzo-*p*-Dioxins During the Extraction of Pentachlorophenol-Contaminated Guar Gum
Yves Tondeur A10292
- 14:20** GPC/Alumina Automated Clean-Up Method For PCDD/Fs and DL-PCBs in Flue Gas Emissions
Andrea Manni A10534
- 14:40** One Step Closer to A 'Cook Book' Method For Dioxin Analysis. Part 1: the Procedure
J. F. Focant A10579
- 15:00** An Efficient and Green Cleanup System for Analysis of Dioxin/Furans, Dioxin-Like PCBs and PBDEs
Chung Ping Wu A10714

Environmental Exposure of POPs Convention Hall 2B

Chairs: Rainer Malisch, Georg Becher

- 15:50** Prevalence of Diabetes and Cardiovascular Disease in Residents Living Near a Creosote Wood Treatment Plant
James Dahlgren A10181
- 16:10** Exposure to PCBs and Hypertension in the Anniston Community Health Survey
Marian Pavuk A10257
- 16:30** Assessment of Human Exposure to PCBs in Anniston Health Survey
Steve Dearwent A10258
- 16:50** Analysis of Polychlorinated Dibenzo-*p*-Dioxins and Dibenzofurans in Various Aqueous Samples in Taiwan
Ngo Thi Thuan A10466

POPs in Humans (Pattern, Levels and Trends) Convention Hall 2C

Chairs: Arnold Schecter, Zongwei Cai

- 14:00** Organic Pollutants in Human Hair from Brazilian Amazon
Joao Torres A10195
- 14:20** Changes of PCBs, PBDEs and HBCD in Breast Milk During up to Ten Months of Lactation
Cathrine Thomsen A10280
- 14:40** Importance of Dust and Diet for the Human Exposure to PBDEs and HBCDs
Laurence Roosens A10294
- 15:00** Natural AhR Agonists from Human Serum
Shunqing Xu A10304

POPs in Humans (Pattern, Levels and Trends) Convention Hall 2C

Chairs: Arnold Schecter, Bingsheng Zhou

- 15:50** Polychlorinated Naphthalene Profiles in Human Serum and Flue Gas from the Metropolitan Area
Hyokeun Park A10330
- 16:10** Assessment of Persistent Organic Pollutants (POPs) in Serum from Guinea-Bissau, Western Africa – A Time Trend Study
Linda Linderholm A10478
- 16:30** Synthesis and Identification of Hydroxylated Polybrominated Diphenyl Ethers in Human Blood
Andreas Rydén A10479
- 16:50** Polybrominated Diphenyl Ethers in Human Milk from Beijing, China
Lei Zhang A10429
- 17:10** Identification of Emerging Environmental Contaminants and Biomarkers in Human Body Fluid Using Accurate Mass Measurement by HRGC-HRMS
Jianwen She A10504

Wednesday August 26

| | | | | | |
|-------------|--|---|---|-------------------------------------|---|
| 08:45-09:30 | Plenary Session 3 Convention Hall 1 | | | | |
| | Phytoremediation and Methods of Control for PCBs in Soils and Sediments - Jerald L. Schnoor, The University of Iowa, USA | | | | |
| 09:30-10:00 | Coffee Break Exhibition Hall | | | | |
| | Room201-A | Room201-BC | Room305-ABC | Convention Hall 2A | Convention Hall 2B |
| 10:00-12:20 | The AhR and Mechanisms of Toxicity | BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation | Quality Assurance and Quality Control (QA/QC) | Temporal and Spatial Trends of POPs | Analysis of BFRs, PFCs and other Emerging Contaminants - Analytical Approaches and New Developments |
| 12:20-13:00 | Lunch (Distributed at Exhibition Hall) | | | | |
| 13:00-17:00 | Optional Excursion to the Great Wall or Forbidden City. Coaches depart from outside venue at 13:00. Please wear your name badge and take the ticket | | | | |
| | | | | | Convention Hall 2C Incineration and Thermal Processes |

Wednesday August 26

8:45 Plenary Session 3 Convention Hall 1

Chairs: Stuart Harrad, Gang Yu

- 8:45** Phytoremediation and Methods of Control for PCBs in Soils and Sediments
Jerald L. Schnoor A10764
The University of Iowa, USA

9:30 Coffee Break Exhibition Hall

The AhR and Mechanisms of Toxicity Room 201-A

Chairs: Daniele Staskal, Michael S. Denison

- 10:00** PPAR Gamma and ER Alpha Are Nuclear Receptors Targets of TBBPA, BPA and Related Halogenated Compounds
Daniel Zalko A10246
- 10:20** Cloning, and Expression of Cytochrome P450 1A, 1C and 1B Genes in Liver, Brain, Gill, and Kidney from PCB 126-Exposed Three-Spined Stickleback (*Gasterosteus Aculeatus L.*)
Kai Gao A10590
- 10:40** TEF Concept and Environment: Science Meets Policy
Marianne Rappolder A10701
- 11:00** Cyclooxygenase-2 As A Critical Factor That Link Dioxin Exposure, AhR Signaling and Toxicity Phenotype in Newborn Mice
Chiharu Tohyama A10656
- 11:20** Ligand and Nucleotide Specificity in Modulating Aryl Hydrocarbon Receptor DNA Binding and Functional Activity
Michael S. Denison A10566
- 11:40** CH223191 is a Ligand-Specific Antagonist of the Ah Receptor
Bin Zhao A10536

12:20 Lunch (Distributed at Exhibition Hall)

- 13:00-17:00** Optional excursion to the Great Wall or Forbidden City. Coaches depart from outside venue at 13:00. Please wear your name badge and take the ticket.

BFRs, PFCs and other Emerging Contaminants - Environmental Levels, Distributions and Transformation Conference Room 201-BC

Chairs: Frans Verstraete, Xie Quan

- 10:00** Distribution of Polyfluoroalkyl Compounds and Mercury in Fish from High-Mountain Lakes in France Originating from Atmospheric Deposition
Lutz Ahrens A10141
- 10:20** PBDEs in Water and Aquatic Biota of the Pearl River Estuary, South China
Bixian Mai A10206
- 10:40** Emission Load of Hexabromocyclododecane in Japan Based on the Substance Flow Analysis
Satoshi Managaki A10580
- 11:00** Levels and Spatial Distribution of Perfluorinated Compounds in Liver Samples from Wild Mink in Sweden
Anna Rotander A10582
- 11:20** Occurrence and Fate of Typical PPCPs in the Aquatic Environment of the Pearl River Delta, China
Xianzhi Peng A10734
- 11:40** Detection of an "Emerging" Flame Retardant, Dechlorane Plus, in Spanish Sewage Sludge
Adrián de la Torre A10496
- 12:00** New Halogenated Norborane Flame Retardants in the Laurentian Great Lakes: Dechloranes 602, 603 and 604
Li Shen A10537

Quality Assurance and Quality Control (QA/QC) Room 305-ABC

Chairs: Bert van Bavel, Takumi Takasuga

- 10:00** Results from the 8th Circuit Interlaboratory for Dioxins (CIND)
Stefano Raccanelli A10091
- 10:20** The First Japanese Inter-Laboratory Trial for Perfluorochemical Analysis in Water (JIL-PFOS-2008), Using the ISO Method 25101: Performance Verification
Nobuyoshi Yamashita A10374
- 10:40** Validation of Method EN 1948 Part 4: Determination of DL-PCB from Stationary Sources.
Bert van Bavel A10529
- 11:00** Studies on Lipid Extraction by Three Different Methods in the Serum and Whole Blood
Junya Nagayama A10107
- 11:20** Analytical Requirements for Determination of Non-Dioxin Like PCBs in Food
Rainer Malisch A10502

Temporal and Spatial Trends of POPs Convention Hall 2A

Chairs: Weiping Liu, Shu Tao

- 10:00** The Vertical Trends of Polychlorinated Naphthalenes in a Dated Sediment Core from Qingdao Coastal Sea, China
Yongliang Yang A10586
- 10:20** Spatial Trends of PBDEs in Sediment of the Great Lakes
Sara B Gewurtz A10535
- 10:40** Dioxin Levels and Congener Patterns in Water, Sediment and Fish from A Coastal Estuary of the Baltic Sea
Magnus Karlsson A10203
- 11:00** Dioxin Concentrations in American Eel (*Anguilla Rostrata*) Captured in Eastern Canada
Jonathan Byer A10096
- 11:20** Contrasting Patterns of Spatial Autocorrelation of PCDD/Fs, Dioxin-Like PCBs and PBDEs in Sediments in Sydney Harbour, Australia
Anthony Roach A10102
- 11:40** High PCB and Low PBDE Exposure in Pelagic North Pacific
June-Soo Park A10341
- 12:00** Status and Trends of Persistent Organic Pollutants in the Global Environment
Bommanna Loganathan A10151

Analysis of BFRs, PFCs and other Emerging Contaminants - Analytical Approaches and New

Convention Hall 2B

Chairs: Jacob de Boer, Qinghua Zhang

- 10:00** Optimization of Matrix Solid Phase Dispersion Extraction Procedure for the Analysis of Polybrominated Diphenyl Ethers in Human Placenta
An Li A10619
- 10:20** Determination of Polybrominated Diphenyl Ethers (PBDEs) Using Liquid Chromatography Coupled to Negative Ionisation Atmospheric Pressure Photoionisation Tandem Mass Spectrometry (LC-NI-APPI-MS/MS): Validation and Application to House Dust.
Mohamed A.E. Abdallah A10029
- 10:40** Development of Atmospheric Pressure Chemical Ionization Technique for the Determination of Halogenated Flame Retardants
Simon Zhou A10034
- 11:00** Simultaneous Monitoring of Matrix Interferents During the Analysis of Perfluorinated Compounds in Environmental Waters and Biota by UPLC®/MS/MS with A Novel Dual Scan-MRM Approach.
Paul Silcock A10287
- 11:20** An Improved Method for the Determination of Perfluorinated Compounds in Whole Blood Using Acetonitrile and Solid Phase Extraction Methods and Separation of Taurodeoxycholic Acid from PFOS Using Ion Exchange Column
Leo Yeung A10609
- 11:40** Parallel Pressurized Solvent Extraction of PCDD/PCDF, PBDE and PFC from Soil, Sludge, and Sediment Samples
Sabine Cleres A10249
- 12:00** Determination of Decamethylcyclopentasiloxane (D5) in Background Air by the Use of Commercial ENV+ SPE-Cartridges
Amelie Kierkegaard A10342

Incineration and Thermal Processes

Convention Hall 2C

Chairs: Ole Schleicher, Jianhua Yan

- 10:00** Long Term Monitoring of PCDD/PCDF –Concepts and Case Studies from Europe
Juergen Reinmann A10517
- 10:20** Behavior of 2-(3,5-Di-Tert-Butyl-2-Hydroxyphenyl) Benzotriazole (DBHPBT) and Unintentionally Produced POPs During Incineration of Solid Waste Containing DBHPBT
Mafumi Watanabe A10041
- 10:40** Design and Operation of Low-PCDD/F Municipal Solid Waste Incineration
Hans Hunsinger A10142
- 11:00** Fingerprints of Chlorinated, Brominated and Mixed Halogenated Dioxins at Two E-Waste Recycling Sites in Guiyu/China
Markus Zennegg A10527
- 11:20** Reduction of Dioxin Emissions from Copper Smelting Plant for Sludge Recycling
Hong Pao-Chen A10198
- 11:40** Estimation and Congener Specific Characterization of PCNs Emission from Secondary Nonferrous Metallurgies in China
Te Ba A10266
- 12:00** DL-PCB and Marker PCB Emission from Shredder Plant Processing Mixed Scrap Measured According to EN 1948-4
Ole Schleicher A10507

Thursday August 27

| 08:45-09:30 | Plenary Session 4 Convention Hall 1 | | | |
|-------------|---|--|---|---|
| | Environmental Monitoring and Specimen Banking - POPs / New Pops Pollution in Japan and Asia-Pacific - Yasuyuki Shibata, National Institute for Environmental Studies, Japan | | | |
| 09:30-10:00 | Coffee Break Exhibition Hall | | | |
| | Room | Meeting Room | Convention Hall 2A | Convention Hall 2B |
| | 201-ABC | 305-ABC | Hall 2A | Hall 2B |
| 10:00-12:20 | POPs in Food and Feed (Levels and Trends) | Toxicology of Dioxins, PCBs and other POPs | BFRs, PFCs and other POPs; public health and exposure | POPs in Air & Indoor Atmospheres (Levels and Processes) |
| 12:20-14:00 | Lunch, Poster Viewing (Buffet at Banquet Hall, Continental Grand Hotel) | | | |
| 14:00-15:20 | POPs in Food and Feed (Levels and Trends) | Toxicology of Dioxins, PCBs and other POPs | Dioxin Exposure Study | POPs in Air & Indoor Atmospheres (Levels and Processes) |
| 15:20-15:50 | Coffee Break Exhibition Hall | | | |
| 15:50-17:30 | Field Studies and Ecotoxicology | Emerging POPs and New Development | Dioxin Exposure Study | POPs in Air & Indoor Atmospheres (Levels and Processes) |
| 19:00-20:30 | Optional Symposium Banquet Crowne Plaza Parkview Wuzhou (5 minutes walking distance) - Delegates with pre-purchased tickets only. | | | |

8:45 Plenary Session 4 Convention Hall 1

Chairs: Georg Becher, Minghui Zheng

- 8:45** Environmental Monitoring and Specimen Banking – POPs / New POPs Pollution in Japan and Asia-Pacific
Yasuyuki Shibata A10765
National Institute for Environmental Studies, Japan

9:30 Coffee Break Exhibition Hall

POPs in Food and Feed (Levels and Trends) Room 201-ABC

Chairs: Olaf Paepke, Qiuyan Wang

- 10:00** Polybrominated Diphenyl Ethers in Food from the USA: Trends by Time and Location
Arnold Schecter A10217
- 10:20** Occurrence of Persistent Organic Pollutants (POPs) in Italian Wild and Farmed Fish in the Mediterranean Sea
Gianfranco Brambilla A10255
- 10:40** The Italian Buffalo Milk Case – Results and Discussion of PCDD/F- and DL-PCB Analysis in Milk, Feeding Stuff and Soil Samples from Campania, Italy
Frank Neugebauer A10289
- 11:00** The Dioxin Contamination Incident in Ireland 2008
Christina Tlustos A10278
- 11:20** Dioxins, PCBs, Polybrominated Diphenylethers and Organochlorine Pesticides in European Eels (*Anguilla Anguilla*)
Wim Traag A10510
- 11:40** Increased Levels of Dioxins in Irish Pig Meat; the Dutch Connection
Ron Hoogenboom A10514
- 12:00** PCDD/F and PCB Analysis of Drinking Water in the Attomole Range
Karl-Werner Schramm A10185

12:20 Lunch (Buffet at Banquet Hall, Continental Grand Hotel)

Toxicology of Dioxins, PCBs and other POPs Room 305-ABC

Chairs: Jae-Ho Yang, Bin zhao

- 10:00** Dietary Composition Influences the Impacts of BDE-47 on Tissue Accumulation, Cerebral Gene Expression and Reflex Development in Perinatally-Exposed Mice Pups.
Anne-Katrine Lundebye A10632
- 10:20** Prediction of Dioxin Dechlorination and Toxicity Change
Yoon-Seok Chang A10464
- 10:40** Exacerbated Hemolytic Anemia with Exposure to Phenylhydrazine in HRI Deficiency
Sijin Liu A10242
- 11:00** Main Potential Sources of Dioxins/Furans Generation at the Territory of Armenia
Anahit Aleksandryan A10008
- 11:20** Nitric Oxide Mediates Dioxin-Induced Apoptosis of Chondrocyte in Culture
Jaeho Yang A10074
- 11:40** Identification of Human Metabolites of 2,3,7,8-TCDD
Markus Zennegg A10124
- 12:00** Impact of Chlorinated Dioxins and Furans on Japanese Quail, Ring-Necked Pheasant, and Domestic Chicken: Insights from in Ovo Studies
Yinfei Yang A10183

BFRs, PFCs and other POPs: Convention
Public Health and Exposure Hall 2A
Chairs: Åke Bergman, Arlene Blum

- 10:00** PBDE Exposure: Which Is More Important, Homes or Offices?
Thomas Webster A10565
- 10:20** Preliminary Assessment of Bioaccessibility of HBCDs from Human Gut Following Indoor Dust Ingestion Using A Physiologically Based Extraction Test (PBET)
Mohamed A.E. Abdallah A10030
- 10:40** Dust from UK Primary School Classrooms and Daycare Centres: Its Significance as a Pathway of Exposure of Young Children to Perfluoroalkyl Compounds (PFCs) and Brominated Flame Retardants (BFRs)
Stuart Harrad A10125
- 11:00** Concentrations of Perfluorinated Compounds in Serum Are Associated with Seafood Consumption in A Norwegian Cohort
Line S. Haug A10169
- 11:20** Polybrominated Diphenyl Ethers in Serum from Californian Mother – Child Pairs
Åke Bergman A10650
- 11:40** Levels of Hexabromocyclododecane and Tetrabromobisphenol-A in Foods and Human Milk from China
Yongning Wu A10042
- 12:00** Bioaccumulation of Dechlorane Plus in Aquatic Food Web from an Electronic Waste Recycling Site, South China
Xiaojun Luo A10730

POPs in Air & Indoor Atmospheres (Levels and Processes) Convention
Hall 2B

- Chairs:** Josep Rivera, Yongchien Ling
- 10:00** PCBs in Ambient Air – Method Evaluation and Background Monitoring – the Hudson River, NY Sediment Remediation Project
Gary Hunt A10235
- 10:20** Air Concentration of Endosulfan in China: Comparing Modeling to Monitoring Results
Hongliang Jia A10321
- 10:40** Behavior Analysis and Control of Brominated Flame Retardants from Household Products Using Model Rooms
Tomohiro Kose A10335
- 11:00** DDTs, Chlordanes and Hexachlorobenzene in the Atmosphere of Chinese Cities
Xiang Liu A10047
- 11:20** Identifying the Contributing Sources of PCDDs/PCDFs by Comparison of Congener Distribution Profiles Observed in Respirable Suspended Particulate Matter Sampled from Ambient Air of Delhi
Sanjay Kumar A10046
- 11:40** Air Borne Particulate Bound Polychlorinated Dibenzodioxins and Dibenzofurans (PCDDs/Fs) Levels in Delhi, India
R. B. Lal A10048
- 12:00** Indoor Air and Dust Concentrations of Neutral and Ionic Perfluoroalkyl Compounds (PFCs) in Vancouver, Canada
Mahiba Shoeib A10231

Destruction and Degradation Technologies Convention Hall 2C

Chairs: Roland Weber, Moo Been Chang

- 10:00** Enhancement of Reductive Dechlorination of Tetrachloroethene by Interaction between Nano-Sized Zero Valent Iron and Vitamin B12: Effect of Physicochemical Factor
Amir Amnorzahira A10111
- 10:20** Catalytic Hydrotreatment of Chlorinated Benzenes in Liquid Systems Under Mild Conditions Over Pd/C and Raney Ni
Chunhai Xia A10585
- 10:40** Dechlorination of Hexachlorobenzene in Contaminated Soils by Cu/Fe Mediated by Nonionic Surfactants
Songhu Yuan A10719
- 11:00** The Strategic Planning Framework for Contaminated Sites Regeneration
Chih C. Chao
- 11:20** Degradation of HCB Using the Synthesized Hierarchical Iron Oxide
Guijin Su A10644
- 11:40** Reduction of Dioxin Emissions from Waelz Process Operated in Acidic or Basic Mode
Moo Been Chang A10056
- 12:00** Enhanced Reductive Dechlorination of Carbon Tetrachloride in Acidic Soil Column Manipulated with Fe(II) and HS?
Kyunghoon Choi A10085

POPs in Food and Feed (Levels and Trends) Room 201-ABC

Chairs: Olaf Paepke, Qixing Zhou

- 14:00** An Investigation of Wild-Caught and Farm-Raised Shrimp Samples with High Concentrations of Polychlorinated Biphenyls
Dennis P. Luksemburg A10526
- 14:20** Dioxin Levels in Livestock and Grassland Near A Large Industrial Area in Taranto (Italy)
Giampiero Scortichini A10552
- 14:40** Levels of POPs in Spanish Commercial Fish Species
Jordi Parera A10694
- 15:00** Prediction of the PCDD/F, DL-PCB, and Total 2005-WHO-TEQ Values on the Basis of Six Congener Concentrations in Fish: Toward A New Screening Strategy for the Control?
Ronan Cariou A10226

Field Studies and Ecotoxicology Room 201-ABC

Chairs: Martin van den Berg, Yongping Zeng

- 15:50** Persistent Organic Pollutants in Eggs of Brown Booby (*Sula Leucogaster*, Aves: *Sulidae*) from Three Reproductive Colonies along the Brazilian Coast
Larissa Cunha A10383
- 16:10** Dioxin-Like Activity in Water of Three Gorges Reservoir Sampled by Semipermeable Membrane Devices
Jingxian Wang A10018
- 16:30** Application of A Panel of Nuclear Receptor/ Reporter Gene Bioassays to Marine Harbor Sediments in Asia
Hidetaka Takigami A10199
- 16:50** Ecotoxicological Effects of Pesticides Pollution: Studies on the Etiology of the Field Deformed Frogs
Qunfang Zhou
- 17:10** Occurrence and Risk Assessment of Pharmaceuticals in Wastewater from Hospitals and Pharmaceuticals Manufactures
Lee Eungsun A10361

Toxicology of Dioxins, PCBs and other POPs Room 305-ABC

Chairs: Sijin Liu, Bixian Mai

- 14:00** TOF-SIMS Mass Spectrometry Imaging Demonstrates A Selective Tropism of BDE-209 Residues Location in Target Tissues of Rats
Daniel Zalko A10233
- 14:20** Genotoxicity and Development Toxicity of Pentachlorophenol in Zebrafish
Qingshun Zhao
- 14:40** Understanding the Estrogenic and Antiestrogenic Activities of Selected Hydroxylated Polybrominated Diphenyl Ethers Using Molecular Simulation
Aiqian Zhang A10336
- 15:00** Tissue Distribution of Polybrominated Diphenyl Ethers and Metabolites in Rainbow Trout (*Oncorhynchus Mykiss*) after Exposure to Decabromodiphenyl Ether (BDE209)
C. L. Feng A10736

Emerging POPs and New Development Room 305-ABC

Chairs: Jerzy Falandysz, Mehran Alaei

- 15:50** Polybrominated Dioxins and Dibenzofurans: A Global Concern?
Peter Haglund A10548
- 16:10** Detection and Stereoselective Analysis of Three Metoprolol Metabolites in STP-Effluent Samples
Heinrich Hühnerfuss A10127
- 16:30** Polychloropropene - Toxaphene Analog Produced in the USSR Was Non-Racemic
Vladimir Nikiforov A10668
- 16:50** Determination of Co-Planar Polybrominated/Chlorinated Biphenyls (Co-PXBS) in Thirty-Eight Mother's Milk of Japan and Estimation of Their Contamination Sources
Souichi Ohta A10560
- 17:10** Associations Between Maternal PBDE Serum Concentrations and Birth Weight and Duration of Gestation
Brenda Eskenazi A10524

Dioxin Exposure Study Convention Hall 2A

Chairs: Linda Birnbaum, Chuanyong Jing

- 14:00** Public Health Impact of PCDDs, PCDFs, and PCBs in Midland, Michigan, USA
David Garabrant A10492
- 14:20** Serum Dioxin Concentrations and Time to Pregnancy
Brenda Eskenazi A10521
- 14:40** The University of Michigan Dioxin Exposure Study: Follow-up Investigation of Subjects with High Serum Concentrations of TEQ, 2,3,7,8-TCDD, 2,3,4,7,8-PECDF, and PCB-126
Alfred Franzblau A10224
- 15:00** Factors That Predict Serum Concentration of 2,3,7,8-TCDD in People from Michigan, USA
Biling Hong A10229

Dioxin Exposure Study Convention Hall 2A

Chairs: Peter Adriaens, Benzhao Zhu

- 15:50** Using the Reverse Kaplan-Meier to Estimate Population Distributions with Data Below a Limit of Detection
Brenda Gillespie A10207
- 16:10** Validation of the Aermod Air Dispersion Model: Application to Congener-Specific Dioxin Deposition from an Incinerator in Midland, Michigan
Peter Adriaens A10243
- 16:30** PCDD/Fs Levels in Human Blood of Different Flemish Populations: Sources and Effects
Willy Baeyens A10191
- 16:50** Logistic Regression Models of High Serum Dioxin Level in PEO-PLE from Michigan, USA
Xiaohui Jiang A10295
- 17:10** Chinese Mitten Crabs in European Rivers: Contamination with Dioxins, PCBs, PBBs and PBDEs and Implications For Human Consumption
Martin Rose A10222

POPs in Air & Indoor Atmospheres (Levels and Processes) Convention Hall 2B

Chairs: Jean-François Focant, Zhengping Hao

- 14:00** Analysis of PCBs in Air Samples Collected at Facilities Related with PCB Containing Products or Wastes in South Korea
Guangzhu Jin A10506
- 14:20** Characteristics of PCDDFs and PCBs in Ambient Air and Dust Around Industrial Parks at Coast and Inland Area
Bo-Chia Chen A10564
- 14:40** PCDD/F Wind-Selective Sampling in Taranto Area
Roberto Giua A10570
- 15:00** Spatial and Seasonal Variation of Atmospheric PCDD/Fs and Coplanar PCBs Around A Steel Plant Area, Northeast China
Yingming Li A10370

POPs in Air & Indoor Atmospheres (Levels and Processes) Convention Hall 2B

Chairs: Jean-François Focant, Shuzhen Zhang

- 15:50** Identification of Tris(1,3-Dichloro-2-Propyl) Phosphate and Other Organophosphate Flame Retardants in U.S. Indoor Environments
Thomas Webster A10369
- 16:10** Investigation of Dioxins and Mercury in the Atmosphere Particulates and Rainwater Runoff from CPDC an-Shun Site and Surrounding Environment
Chih C. Chao A10140
- 16:30** Long Term Measurement of I-Teq in Correlation to PM1, PM2,5 and PM10 Measurements
Gerhard Kahr A10135
- 16:50** Does Precipitation Represent Air Pollution by Perfluorinated Chemicals?
Sachi Taniyasu A10376
- 17:10** Investigation of Hydroxylated Polychlorinated Biphenyls (OH-PCBs) in the Air and the Sediments Around the Paper Recycling Plant
Motoharu Suzuki A10438

Global Fate & Long Range Transport Convention Hall 2C

Chairs: Hayley Hung, Hong He

- 14:00** Sources and Pathways of Polycyclic Aromatic Hydrocarbons Transported to Alert, the Arctic
Shu Tao 10318
- 14:20** PCDD/F Measurement at a High-Altitude Station in Central Taiwan: Evaluation of POPs via Long Range Transport
Kai Heissn Chi
- 14:40** Monitoring Long-Rang Atmospheric Transport (LRAT) of Organochlorine Pesticides (OCPs) at a Remote Background Site (Tengchong Mountain) in Southwestern China
Gan Zhang A10071
- 15:00** Development of a Mathematical Model For 3D-Dynamics of Persistent Organic Pollutant in the East China Sea
Jun Ono A10308

Global Fate & Long Range Transport Convention Hall 2C

Chairs: Ramon Guardans, Gan Zhang

- 15:50** The Global Monitoring Plan and the Effectiveness Evaluation of the United Nations Environment Programme (Unep)/Stockholm Convention on Persistent Organic Pollutants (POPs)
Hayley Hung
- 16:10** The Rise of the Finely-Advanced Transboundary Environmental Model (Fate): A State-of-the-Art Model Prediction of the Global Sink of Persistent Organic Pollutants
Toru Kawai A10377
- 16:30** The Dependence of Persistent Organic Pollutant (POP) Content in Atmospheric Air of the Russian Arctic on Ambient Temperature
Alexei Konoplev A10392
- 16:50** The Spanish Monitoring Programme on POPs under the Stockholm Convention
Begona Jimenez A10702
- 17:10** Spatial and Temporal Pattern of Organochlorine and Current-Use Pesticides in the Global Atmosphere
Frank Wania A10574

19:00 Optional Symposium Banquet at Banquet Hall, Crowne Plaza Parkview Wuzhou (5 minutes walking distance) - Delegates with pre-purchased tickets only.

Friday August 28

| | | |
|--------------------|---|--------------------------|
| 08:45-09:30 | Plenary Session 5 | Convention Hall 1 |
| | Dioxins and Dioxin-Like PCB in Food and Feed - Still a Matter of Concern? - Peter Fürst, Chemisches und Veterinäruntersuchungsamt Münsterland-Emscher-Lippe (CVUA-MEL), Germany | |
| 10:00-10:40 | Coffee Break | Exhibition Hall |
| 10:00-12:00 | Session Summaries Students' Awards Presentation of Dioxin 2010 | |
| 12:20-13:00 | Lunch (Buffet at Banquet Hall, Continental Grand Hotel) | |

Friday August 28

8:45 Plenary Session 5 Convention Hall 1

Chairs: Mehran Alaee, Yongning Wu

8:45 Dioxins and Dioxin-Like PCB in Food and Feed -
Still a Matter of Concern?
Peter Fürst A10766
*Chemisches und Veterinäruntersuchungsamt
Münsterland-Emscher-Lippe (CVUA-
MEL), Germany*

9:30 Coffee Break Exhibition Hall

10:00 Session Summaries Convention Hall 1

Students' awards
Presentation of Dioxin 2010

12:10 Lunch (Buffet at Banquet Hall, Continental Grand Hotel)

我國研究單位在本次研討會的發表著作

| |
|---|
| 主題：Exposure (human and environmental exposure) |
| <ol style="list-style-type: none"> 1. Analysis of polychlorinated dibenzo-p-dioxins and dibenzofurans in various aqueous samples in Taiwan 2. Current levels of PBDEs in breast milk from southern Taiwan- estimation of their correlations with women' s age, education level, and occupational exposure 3. Bioactive dose of dioxin-like compounds in blood samples of A population exposed to chemical waste of a PCPs factory in Taiwan 4. Exposure assessment of polybrominated diphenyl ether for electronics recycling workers (blood) in Taiwan 5. Associations between PCDD/Fs, PCBs, OCPs and PBDEs in breast milk and thyroid, growth, and steroid sex hormones |
| 主題：Environment levels and fate |
| <ol style="list-style-type: none"> 1. Characteristics of PCDD/Fs and PCBs in ambient air and dust around industrial parks at coast and inland area 2. Microbial degradation of nonylphenol (NP) in river sediment 3. The dioxin inventory of wastewater discharges in Taiwan 4. Distribution and source of polybrominated diphenyl ethers in Taiwan indoor environment 5. Levels of PCDDs, PCDFs, dioxin-like PCBs, and PBDEs in fish samples from rivers and estuaries in Taiwan 6. Transformation processes, possible sources and sink of PCDD/Fs in a reservoir in northern Taiwan |
| 主題：Control technologies and policies |
| <ol style="list-style-type: none"> 1. The control strategies for POPs in Taiwan |
| 主題：Food and feed safety, drinking water |
| <ol style="list-style-type: none"> 1. Determination of PCDDs/DFs and dioxin-like PCBs in egg and fish feed samples in Taiwan by the DR CALUX® bioassay |
| 主題：Sources, formation and control measures |
| <ol style="list-style-type: none"> 1. Reduction of dioxin emissions from copper smelting plant for sludge recycling |
| 主題：Toxicology & Risk Assessment |
| <ol style="list-style-type: none"> 1. Health risk assessment of human exposure to fugitive dust during soil excavation in a dioxins and mercury contaminated site 2. Joint Effects of phthalate exposure and serum paraoxonase (PON1) activity on estrogen-dependent diseases in Taiwanese women |

DETERMINATION OF PCDDs/DFs AND DIOXIN-LIKE PCBs IN EGG AND FISH FEED SAMPLES IN TAIWAN BY THE DR CALUX[®] BIOASSAY

Shyu TS¹, Lee YH¹, Lee ML¹, Lu SY¹, Chu C¹, Wu CI¹, and Kao CW¹

¹Taiwan Agricultural Chemicals and Toxic Substances Research Institute, Council of Agriculture, Taichung County 41358

Abstract:

After an in-depth training and a 3-phase cross-validation by staff of the BioDetection Systems, we obtained the licence for the DR CALUX[®] bioassay. The control charts were initially set up by using 1 pM and 3 pM 2,3,7,8-TCDD and two certified reference materials for quality assurance and quality control (QA/QC) of performing the DR CALUX[®] bioassay in our laboratory. Thirty-one egg, six eel-feed, nine seabass-feed, and eight tilapia-feed samples were collected and their fat contents were determined to be $10.3 \pm 1.1\%$, $9.2 \pm 1.0\%$, $11.5 \pm 2.5\%$, and $8.2 \pm 1.3\%$, respectively. By the DR CALUX[®] bioassay, dioxins and dioxin-like compounds were determined to be 2.0 ± 0.7 pg DR CALUX-TEQ/g fat, 0.4 ± 0.1 ng DR CALUX-TEQ/kg product, 0.9 ± 0.6 ng DR CALUX-TEQ/kg product, and 0.3 ± 0.1 ng DR CALUX-TEQ/kg product, respectively, which were all below the EU-limits for egg and fish feeds.

Introduction

The CALUX bioassay has been used widely as a sensitive method for detection of dioxin and dioxin-like compounds (PCDDs/DFs and dioxin-like PCBs) in various materials.¹⁻⁴ We planned to use DR CALUX[®] bioassay from the BioDetection Systems (BDS, the Netherlands) to screen for the presence of dioxin and dioxin-like compounds in fishery, poultry, livestock products, and various feeds. After an in-depth training and a 3-phase cross-validation by staff of the BioDetection Systems, we obtained the licence for the DR CALUX[®] bioassay. In this study, we first set up control charts using 1 pM and 3 pM 2,3,7,8-TCDD and two certified reference materials with known amounts of dioxin and dioxin-like compounds. The control charts were and will be used for quality assurance and quality control (QA/QC) of performing the DR CALUX[®] bioassay in our laboratory. In the end, we determined the contents of dioxin and dioxin-like compounds in 31 egg and 23 fish feed samples using the DR CALUX[®] bioassay.

Material and Methods

Sample collection

During 2006-2008, 23 fish feed samples were collected from six eel, nine seabass, and eight tilapia aquaculture farms, and 31 egg samples were collected from chicken farms, supermarkets, and vendors. All samples were

homogenized immediately after collection and stored at -20°C until use. Two certified reference materials (CRMs), one fish oil sample and one feed sample, were purchased from the BioDetection Systems.

Extraction of dioxin and dioxin-like compounds and determination of fat content

Extraction of dioxins and dioxin-like compounds was carried out according to the manuals of the DR CALUX[®] bioassay.⁴ Approximately 9 gram of homogenized fish feed sample or 12 gram of homogenized egg sample was thawed, mixed with a mixture of water and isopropanol, and extracted with a mixture of hexane and diethyl ether (97:3, V/V) for three times. The organic phases were pooled and evaporated by nitrogen gas. Evaporation was interrupted periodically to weight the extract and stopping evaporation as the weight reached to a constant value, which was the fat content of the sample. The extract then passed through a sulfuric acid activated silica column and was eluted with a mixture of hexane and diethyl ether (97:3, V/V). The eluent, which contained dioxins and dioxin-like compounds, was collected, evaporated to dryness, and re-dissolved in 25 µL dimethyl sulfoxide (DMSO) for the DR CALUX[®] bioassay.

Determination of the amount of dioxins and dioxin-like compounds by the DR CALUX[®] bioassay

DR CALUX[®] bioassay was used according to the instruction manual of DR CALUX[®] bioassay⁴. Rat hepatoma H4IIE cell line containing an AhR-DRE-regulated luciferase gene-carrying plasmid was used for the assay. Briefly, cells were cultivated under controlled conditions until confluent growth. Cells were collected and seeded into in wells of a 96-well microtiter plate. The plate was incubated at 37 °C under 5% CO₂ for 24 hrs. Then, sample extract in 25 µL DMSO was added into the wells containing the cells. The microtiter plate was incubated at 37°C under 5% CO₂ for 22 to 23 hrs. After the incubation, cultural medium was removed from the well and lysis buffer was added to lyse the cells. To measure the luciferase activity of the lysed cells, luciferase substrate was added to the wells and luminescence was quantified with a luminometer. In the same microtiter plate, 2,3,7,8-TCDD of 0, 0.3, 1, 3, 10, 30, 100, 300 pM in DMSO was included for generation of standard calibration curve, with which the amount of dioxins and dioxin-like compounds in the extracts could be determined by intrapolation. One of the two certified reference materials was also included in the same microtiter plates. Results from these two materials and 1 pM and 3 pM 2,3,7,8-TCDD were used for generation of control charts. One of the two certified reference materials was also included in the same microtiter plates. Results from these two reference materials and 1 pM and 3 pM 2,3,7,8-TCDD were used for generation of control charts according the control chart set up manual from the BioDetection Systems. The amount of dioxin and dioxin-like compounds in fish oil and egg samples were expressed as pg DR CALUX TEQ/g fat, whereas those in feed samples were expressed as ng DR CALUX TEQ/kg product.

Results and Discussion

Control charts set up for laboratory QA/QC

Four control charts were set up using 1 pM and 3 pM 2,3,7,8-TCDD and the two certified reference materials. The results of 1 pM and 3 pM 2,3,7,8-TCDD are showed in Figure 1. The mean value for 1 pM 2,3,7,8-TCDD was 0.9 ± 0.1 pM, whereas those for 3 pM 2,3,7,8-TCDD was 3.1 ± 0.1 pM.

The control charts of the two certified reference materials are shown in Figure 2. The average amount of one certified reference material, the feed sample, was 1.0 ± 0.2 ng DR CALUX TEQ/kg product (CV= 20%), whereas those for the other certified reference material, the fish oil sample, was 3.7 ± 1.0 pg DR CALUX TEQ/g fat (CV=27%). The 63 values of these two certified reference materials are all within the mean value $\pm 3SD$. The results indicating the DR CALUX performing system is under controlled and kept at relatively stable condition.

According to the certificates, the two certified reference materials, feed and fish oil samples, contained 1.5 ng PCDD/PCDF/PCB TEQ/kg product and 2.2 pg PCDD/PCDF/PCB TEQ/g fat, respectively, by the HRGC/MS analysis. However, they were determined by the DR CALUX[®] bioassay to contain 1.4 ± 0.63 (uncertainty) ng DR CALUX TEQ/kg product and 3.7 ± 2.1 (uncertainty) pg DR CALUX TEQ/g fat, respectively. Our determination value (1.0 ± 0.2 ng DR CALUX TEQ/kg product) of the feed reference sample by the DR CALUX[®] bioassay was lower than the expected value (1.4 ng DR CALUX TEQ/kg product), but was within the range, whereas our determination value (3.7 ± 1.0 pg DR CALUX TEQ/g fat) of the fish oil reference sample was almost identical to the expected value (3.7 DR CALUX TEQ /g fat).

Bioassay results of egg and fish feed samples

The fat contents and the dioxin and dioxin-compound contents of 31 egg and 23 fish feed samples were determined and the results are shown in Table 1. For the egg samples, the fat content ranged from 7.8% to 12.2% and the average dioxin and dioxin-compound amount was 2.0 ± 0.7 pg CALUX-TEQ/g fat. The dioxin and dioxin-compound contents of all of the 31 egg samples were lower than the EU limit for egg, i.e., 6 pg WHO-PCDD/F-PCB-TEQ/g fat.^{4,5}

For the 23 fish feed samples, the fat contents ranged from 5.9% to 14.5%. The average contents of dioxin and dioxin-like compounds of feed samples from six eel, nine seabass, and eight tilapia aquaculture farms were 0.4 ± 0.1 , 0.9 ± 0.6 , 0.3 ± 0.1 ng CALUX-TEQ/kg product, respectively (Table 1). Of the three groups of fish feed samples, the average content of dioxin and dioxin-like compound of seabass-feed samples was higher than those of the two other groups of fish feed samples. But the dioxin and dioxin-like compound contents of all of the fish feed samples were below the EU limit for fish feed, i.e., 2.25 ng WHO-PCDD/F-PCB-TEQ/kg product.^{4,6}

In the future, we plan to use DR CALUX[®] bioassay and the HRGC/MS assay to determine the contents of dioxin and dioxin-like compounds in feeds, fishery, livestock and poultry products. The results from the two methods will be compared in order to evaluate the application of DR CALUX[®] bioassay for analysis of these materials in Taiwan.

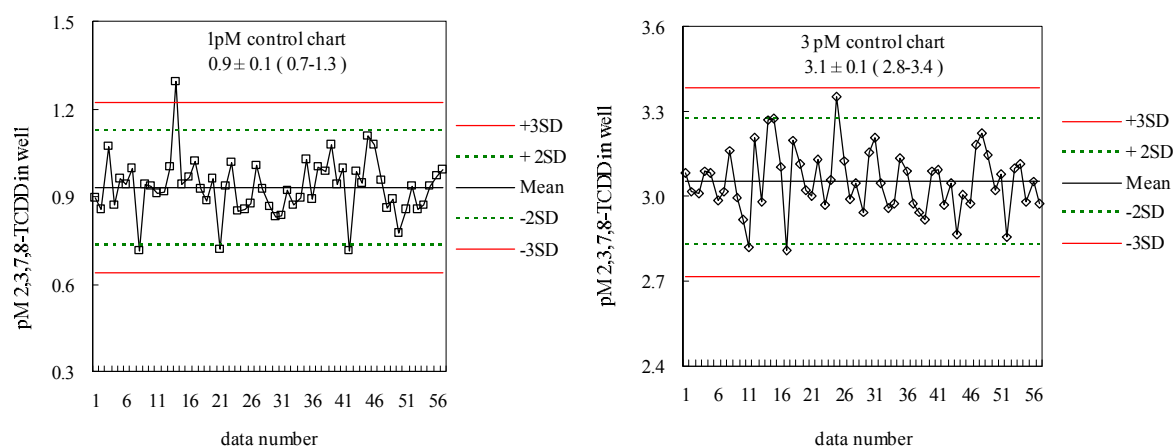


Figure 1. The control charts of 1 pM (left) and 3 pM (right) 2,3,7,8-TCDD are being used to monitor the performance of DR CALUX .

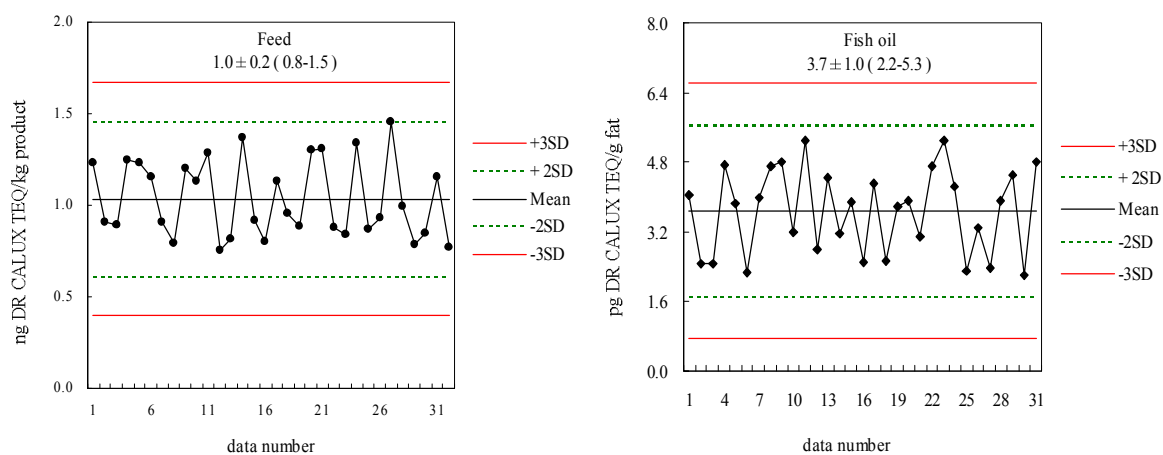


Figure 2. Control charts of the two certified reference materials, one feed and one fish oil samples. The analysis results of these two certified reference materials are all within the mean value \pm 3SD.

Table 1. Fat contents and the DR CALUX[®] analysis results of dioxins and dioxin-like compounds in egg and fish feed samples

| Sample | Number of sample | Fat content (%) | Dioxin and dioxin-like compounds (pg DR CALUX TEQ /g fat) ² or (ng DR CALUX TEQ /kg product) ² |
|--------------|------------------|------------------------------------|--|
| Eggs | 31 | 10.3 ± 1.1 (7.8~12.2) ¹ | 2.0 ± 0.7 (1.3~4.8) ¹ |
| Fish feeds | 23 | | |
| eel-feed | 6 | 9.2 ± 1.0 (7.9~10.4) | 0.4 ± 0.1 (0.2~0.5) |
| seabass-feed | 9 | 11.5 ± 2.5 (5.9~14.5) | 0.9 ± 0.6 (0.3~1.7) |
| tilapia-feed | 8 | 8.2 ± 1.3 (6.1~10.2) | 0.3 ± 0.1 (0.2~0.5) |

¹Numbers represent mean ± SD with the ranges shown in parentheses.

²Unit for egg is (pg DR CALUX TEQ /g fat), for feed is (ng DR CALUX TEQ /kg product).

Acknowledgements

This study was supported by a grant from the Council of Agriculture (COA), Taiwan.

References

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2. Gizzi G, Hoogenboom L.A.P., von Holst C., Rose M. and Anklam E. *Food Add. Contam.* 2006; 22:472–481.
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