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行政院衛生署疾病管制局九十年度委託研究計畫

# 外籍勞工之泰國肝吸蟲引致本土 感染之可能之研究

委託研究成果報告

執行機構：國立陽明大學寄生蟲學研究所

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\* 本研究報告僅供參考，不代表衛生署疾病管制局意見 \*

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## 研究報告中文摘要：

在台北醫學大學附屬醫院家庭醫學科之協助及合作下，於 90 年 3-7 月間收集泰國外勞 1,159 人大便標本，用簡明沉澱法及鏡檢，檢獲 51 位外勞傳染寄生蟲，平均傳染率 4.4%。女性傳染率 (5.1%) 較高於男性 (4.2%)。傳染 10 種寄生蟲 (蠕蟲 7 種，原蟲 3 種)，致病性 8 種 (蠕蟲 7 種，原蟲 1 種)，泰國肝吸蟲 7 人。傳染率以糞小桿線蟲 (1.4%) > 泰國肝吸蟲 (0.6%) ≥ 梨形鞭毛蟲 (0.6%) > 蛔蟲 (0.4%) > 鉤蟲 (0.3%) ≥ 鞭蟲 (0.3%) ≥ 大腸阿米巴 (0.3%) ≥ 微小阿米巴 (0.3%) > 薑片蟲 (0.1%) ≥ 蟯蟲 (0.1%)。

4 月及 11 月間前往台灣南部高雄縣澄清湖，美濃鎮中正湖，中部南投縣日月潭及北部苗栗縣明德水庫等湖泊，採集與泰國肝吸蟲第一中間宿主相同屬 (*Bithynia*) 豆 (沼) 螺。僅在澄清湖採獲 35 隻豆螺之空殼及其他 6 種淡水螺：石田螺、瘤蜷螺、塔蜷螺、網蜷螺、福壽螺及圓寶螺。

為進行感染實驗，曾收集到感染泰國肝吸蟲夫婦 2 人之大便標本，用金屬篩過濾法及靜置沉澱，未能檢獲到蟲卵，可能由於他 (她) 們傳染泰國肝吸蟲數目少，蟲卵密度較低之緣故。擬再收集 7 位泰國肝吸蟲患者大便標本蟲卵進行感染實驗。在台北醫學大學附屬醫院之協助下，函請外勞媒介公司通知 7 位患者予以免費治療，由排出大便中收集蟲體，自子宮中採集蟲卵，因未能獲得外勞媒介公司之合作，而停止此項試驗。

中文關鍵詞(至少三個)：泰國肝吸蟲、豆 (沼) 螺、石田螺、瘤蜷螺、塔蜷螺、網蜷螺、福壽螺及圓寶螺

Abstract:

Under the assistance and cooperation of the Department of Family Medicine, Taipei Medical University Hospital, stool specimens were collected from 1,159 foreign workers between March and July 2001. By the simple sedimentation method, 15 workers were found to be infected with parasites. The overall infection rate was 4.4%. The rate of females (5.1%) was higher than that of males (4.2%). Ten species (7 helminths and 3 protozoa) were found and 8 (7 helminths and 1 protozoa) were pathogenic. Seven cases with *Opisthorchis viverrini* were found. The infection rate of *Strongyloides stercoralis* (1.4%) was the highest > *O. viverrini* (0.6%) ≥ *Giardia lamblia* (0.6%) > *Ascaris lumbricoides* (0.4%) > Hookworm (0.3%) ≥ *Trichuris trichiura* (0.3%) *Endoameba coli* (0.3%) ≥ *Edolimax nana* > *Fasciolopsis buski* (0.1%) ≥ *Enterobius vermicularis* (0.1%).

In April and November, we went to Cheng-Ching Lake, Kaohsiung County, Chung-Cheng Lake, Meinung Town, South Taiwan, Sun Moon Lake, Nantou County, Central Taiwan, and Ming-Teh Reservoir, Miaoli County, North Taiwan to collect *Bithynia* snails belong to the same genus of the first intermediate host of *O. viverrini*. Only 35 empty shells of *Bithynia* snails were collected. However, six other species of freshwater snails were collected: *Sinotaia quadrata*, *Tarebia granifera*, *Thiara scabra*, *Melanoid tuberculata*, *Pomacea canaliculata*, and *P. scalaris*.

In order to conduct the experimental infection, we also collect stool specimens from a couple of cases infected with *O. viverrini*. After filtering by the metal filter method and standstill sedimentation, no eggs were recovered. These findings may be due to the fact that the number of worms infecting these cases was very few and the intensity of eggs was very low. We plan to collect *O. viverrini* eggs from the seven infected persons. Under the assistance of the Taipei Medical University Hospital, the foreign worker mediating companies were acknowledged by letters to inform the seven cases for free chemotherapy to collect adult worms from the stool specimens and eggs from the uterus of the worms. However, this experiment was interrupted because of the uncooperation of the foreign worker mediating companies.

Keyword: *Opisthorchis viverrini*, *Bithynia* snail, *Sinotaia quadrata*, *Tarebia granifera*, *Thiara scabra*, *Melanoid tuberculata*, *Pomacea canaliculata*, and *P. scalaris*

行政院衛生署疾病管制局九十年度研究計劃年度報告

外籍勞工寄生蟲之調查及感染動物可能性之研究

Studies on prevalent possibility of *Opisthorchis viverrini* infection in Taiwan

## 序 言

1992 年本省基於國建計劃及大型企業均極度缺乏工人，政府遂採用開放政策，引進外籍勞工以疏解勞力之不足。1993 年，引進勞工 31 萬餘人分別來自泰國、印尼、菲律賓、馬來西亞及越南。這些國家均位於東南亞熱帶地區，教育水準低，經濟落後，環境衛生差，人民貧窮，生活困苦。昆蟲媒介之瘧疾、血絲蟲病、登革熱，土壤傳播之腸寄生蟲病，水源感染之血吸蟲病，食物傳播之肝吸蟲、肺吸蟲、腸吸蟲、菲律賓毛線蟲等，均可能由於外勞之引進，而流行於本省。數十年來寄生蟲病防治之成果，毀於旦夕，對國民之健康影響至鉅。

1993 年行政院衛生署科技研究計畫中，特別委託中華民國寄生蟲學會轉交國內八所公私立醫學院寄生蟲學科提出申請研究計畫，經過三年（1993-1995）自 68 所醫院共收集 53,331 位外籍勞工之大便，由檢查結果顯示總傳染率平均 15.7%，共檢獲寄生蟲 36 種（蠕蟲 24 種，原蟲 12 種）。具有致病力寄生蟲 30 種（蠕蟲 23 種，原蟲 7 種）。其中以泰國肝吸蟲傳染率最高（4.9%）>鉤蟲（2.7%）>鞭蟲（2.3%）>糞小桿線蟲（1.0%）>梨形鞭毛蟲（0.9%）>蛔蟲（0.8%）>隱孢子蟲（0.3%）>痢疾阿米巴（0.2%）。印尼勞工傳染率最高（19.7%），依次為泰國（14.7%）、菲律賓（12.4%）、馬來西亞（5.9%）。男性（14.7%）高於女性（12.4%）（Peng et al., 1993; Fan et al., 1993, 1994, 1996, 1999; Lo et al., 1993-1995; Wang et al., 1998; Lee et al., 1993-1995; Lu et al., 1994, 1995; Yeh et al., 1994, 1995; Hsin et al., 1995; Lee et al., 1996）。

1999 年引進外籍工 591,194 人，平均傳染率 1.7%。越南勞工最高（2.6%）>印尼勞工（2.0%）≥菲律賓勞工（2.0%）>泰國勞工（1.3%）>馬來西亞勞工（0.7%）。共引進寄生蟲 11 種（蠕蟲 7 種，原蟲 4 種）。具有致病性 9 種（蠕蟲 7 種，原蟲 2 種）。梨形鞭毛蟲傳染率最高（13.0%）>鉤蟲（12.1%）>鞭蟲（10.9%）>糞小桿線蟲（9.8%）>痢疾阿米巴（5.5%）>肝吸蟲（4.3%）>蛔蟲（3.7%）>條蟲（0.6%）>東方蟲毛線蟲（0.5%）（Center of Disease Control, 1999-2000）。

2000 年引進外籍工 661,841 人（初入境 166,451 人及入境滿半年者 456,390 人），寄生蟲平均傳染率 1.9%（初入境 0.2%及入境滿半年者 2.5%）。傳染率以

越南勞工最高（3.0%）> 印尼勞工（2.5%）> 菲律賓勞工（2.3%）> 馬來西亞勞工（2.2%）> 泰國勞工（1.3%）（Center of Disease Control, 1999-2000）。再者引進瘧疾 3 例（Shiao & Chan, 1995）。

關於外籍勞工引進之血吸蟲、血絲蟲、菲律賓毛線蟲、瘧疾及條蟲在本省均有臨床病例及流行調查，經治療及防治後均已治癒或根除。惟泰勞引進泰國肝吸蟲（*Opisthorchis viverrini*），若能在台灣流行，則嚴重影響國人之健康。泰國肝吸蟲之發育需要兩個中間宿主（Intermediate hosts, IH）。第一中間宿主（1<sup>st</sup> IH）為淡水螺（Freshwater snail），第二中間宿主為淡水魚（Freshwater fish）。其流行地區為中南半島之泰國、老撾、越南及馬來西亞等國家，泰國北部居民感染率最高（58-95%）。Wykoff（1965）估計該地區約 350 萬人受到感染。最近報告，泰國約計 8,000,000 人受傳染（Khamboonuang et al., 1997）。

根據 Wykoff（1965）報告，第一中間宿主為豆螺（*Bithynia goniomphalus*，*B. goniophalus*，*B. laevis*）。第二中間宿主為數種淡水魚，其中最重要的是 *Puntens orphoides*，*Hampula dispar*，*Cyclocheilichthysiaia*。

上述三種第一中間宿主及三種第二中間宿主在本省均未見諸報告，惟根據一般寄生蟲學者之意見，各種吸蟲之發育，對第一中間宿主之選擇極為嚴格，即適合宿主之感染率也很低。惟對第二中間宿主較不嚴格，且感染率較高。因此泰國肝吸蟲之動物感染，因缺乏適宜之中間宿主，在本省之感染之機率可能性很低。

基於泰國肝吸蟲之成蟲及蟲卵與台灣流行中華肝吸蟲（*Clonorchis sinensis*）之成蟲及蟲卵頗為相似，兩種肝吸蟲第一中間宿主均為豆螺屬（*Bithynia*），分佈台灣之豆螺，為滿州豆（沼）螺（*Bithynia manchourica*）（Fan et al., 1992）及赤豆螺（*Bithynia fuchsianus*）（Chao et al., 1985）二種。

目前泰勞引進寄生蟲之種別及泰國肝吸蟲感染動物之可能性則為本研究之目的。



## 方法及步驟

### 一、外勞寄生蟲之調查 (Survey of imported parasitic infection among Thailand workers) :

應用本研究室修正“簡易沉澱法”(Simple sedimentation) 其步驟如下：

1. 用竹籤 (15 cm) 採取約 1 gm 大便標本，放入編號碼塑膠沉澱管 (15 ml)。
2. 沉澱管放於試管架，用塑膠洗瓶 (500 ml) 注入生理鹽水 10 ml 於沉澱管，用二根竹籤充分攪拌，形成懸垂液，靜置 5 分鐘，形成沉澱。
3. 緩緩倒去上清液，再加生理鹽水 10 ml 予以振盪，靜置 5 分鐘後，形成沉澱。
4. 緩緩傾去上清液，用塑膠吸管 (5 ml) 予以振盪，吸取混合沉澱液 2 滴於玻片上 (75x25 mm) 上，各加一蓋片 (22x22 mm)。
5. 在光學顯微鏡 (100x, 200x) 檢查蟲卵及幼蟲，用油鏡檢查 (1,000x) 囊體及活動體，鑑定其種別，予以記錄。

附註：

- (1) 若新鮮大便有血液或膿性分泌物，需檢查原蟲之活動體 (Trophoids) 及囊體 (Cysts)。用吸管分別吸生理鹽水 1 滴及碘液 1 滴，均放於玻片上，兩滴距離約 1 cm，用竹籤先塗抹大便標本於生理鹽水，後塗抹於碘液，加一蓋片使兩個厚膜接觸成一條直線，先檢查生理鹽水膜之活動體，再檢查碘液之囊體，鑑定其種別，予以記錄。
- (2) 簡易沉澱法之優點：無大便臭味，不需用特定檢驗器材及化學藥品，且經濟方便，任何實驗室均可使用。

### 二、豆螺之調查

根據過去報告，本省南部高雄縣美濃，中部南投縣及北部苗栗市均為中華肝吸蟲病之高度流行區，當地居民及淡水魚之傳染率均高達 50% (Chow,

1960; Clarke et al., 1971; Ong & Lu, 1979)。有關第一中間宿主淡水螺之生態調查及傳染實驗僅有一篇報告，其感染率則低於 1% (Kim & Kuntz, 1964)。

爲了目前之研究，我們曾多次到高雄縣澄清湖，美濃地區中正湖，南投縣日月潭及苗栗地區曾文水庫及其他湖泊採集豆螺。除在澄清湖採到 35 隻死亡滿州豆螺外，其他地區均未發現（第二表）。曾訪問進行多年中華肝吸蟲研究高雄醫學大學寄生蟲學科主任顏全敏教授，他曾到台灣中南部中華肝吸蟲流行區之湖泊調查，十餘種淡水魚均發現中華肝吸蟲具有不同傳染率（28.5-91.6%），則迄未尋獲中華肝吸蟲第一中間宿主豆螺（Yen et al., 1987）。

## 討 論

泰國肝吸蟲 (*Opisthorchis viverrini*) 之第一中間宿主，在泰國具有三種豆(沼)螺：*Bithynia siamensis siamensis*、*B. s. goniomphalos* 及 *Bithynia funiculata*，此三種豆螺在台灣未曾發現。惟台灣流行之中華肝吸蟲 (*Clonorchis sinensis*) 之形態、生活史及確定宿主均與泰國肝吸蟲較相似，又均寄生於肝臟。而中華肝吸蟲第一中間宿主也是豆(沼)螺屬，為滿州豆螺 (*Bithynia manchourica*) 及豆(花比)螺 (*B. fuchsianus*)。因此，即前往台灣南部高雄縣澄清湖，美濃鎮中正湖，台灣中部南投縣日月潭及北部苗栗縣明德水庫等湖泊，採集淡水螺。僅在澄清湖捕獲 7 種淡水螺，其中具有滿州豆螺 35 隻，惟均為死亡螺殼及 105 隻生活瘤螺 (*Tarebia granifera*)，目前實驗室在玻璃缸 (35 × 25 × 22 cm) 已產生很多幼螺。在 1987 年進行中華肝吸蟲研究時，曾在瘤螺體內檢獲中華肝吸蟲之尾動幼蟲 (cercariae)。擬應用這些生活幼小瘤螺代替豆螺為泰國肝吸蟲第一中間宿主，在實驗室進行泰國肝吸蟲之感染實驗。

在 4 月 20 日曾邀請泰國肝吸蟲患者夫婦兩人送來全天大便標本兩份 (150 gm 及約 120 gm)，加水稀釋後用金屬網 (37 μm) 過濾，靜置沉澱三次，後經旋轉沉澱，吸取沉澱物鏡檢，迄未檢獲蟲卵。此陰性結果可能因為兩位患者傳染蟲數少，蟲卵密度低之緣故。

為繼續獲得泰國肝吸蟲卵，再進行感染第一中間宿主豆螺或幼小瘤螺，曾商請台北醫學大學附屬醫院家庭醫學科與外勞媒介公司連繫及協助，通知此 7 位患者來台北醫學大學附屬醫院予以免費治療，藉以檢獲大便中排出蟲體，從成蟲子宮採集蟲卵，繼續進行感染實驗。據外勞媒介公司答覆，此 7 位外勞，目前不詳工作地址或已返回泰國。因此，此項感染實驗因無泰國肝吸蟲卵則無法繼續進行。

## 摘 要

在台北醫學大學附屬醫院家庭醫學科之協助及合作下，於 90 年 3-7 月間收集泰國外勞 1,159 人大便標本，用簡明沉澱法及鏡檢，檢獲 51 位外勞傳染寄生蟲，平均傳染率 4.4%。女性傳染率 (5.1%) 較高於男性 (4.2%)。傳染 10 種寄生蟲 (蠕蟲 7 種，原蟲 3 種)，致病性 8 種 (蠕蟲 7 種，原蟲 1 種)，泰國肝吸蟲 7 人。傳染率以糞小桿線蟲 (1.4%) > 泰國肝吸蟲 (0.6%) ≥ 梨形鞭毛蟲 (0.6%) > 蛔蟲 (0.4%) > 鉤蟲 (0.3%) ≥ 鞭蟲 (0.3%) ≥ 大腸阿米巴 (0.3%) ≥ 微小阿米巴 (0.3%) > 薑片蟲 (0.1%) ≥ 蟯蟲 (0.1%)。

4 月及 11 月間前往台灣南部高雄縣澄清湖，美濃鎮中正湖，中部南投縣日月潭及北部苗栗縣明德水庫等湖泊，採集與泰國肝吸蟲第一中間宿主相同屬 (*Bithynia*) 豆 (沼) 螺。僅在澄清湖採獲 35 隻豆螺之空殼及其他 6 種淡水螺：石田螺、瘤卷螺、塔卷螺、網卷螺、福壽螺及圓寶螺。

為進行感染實驗，曾收集到感染泰國肝吸蟲夫婦 2 人之大便標本，用金屬篩過濾法及靜置沉澱，未能檢獲到蟲卵，可能由於他 (她) 們傳染泰國肝吸蟲數目少，蟲卵密度較低之緣故。擬再收集 7 位泰國肝吸蟲患者大便標本蟲卵進行感染實驗。在台北醫學大學附屬醫院之協助下，函請外勞媒介公司通知 7 位患者予以免費治療，由排出大便中收集蟲體，自子宮中採集蟲卵，因未能獲得外勞媒介公司之合作，而停止此項試驗。

## Summary

Under the assistance and cooperation of the Department of Family Medicine, Taipei Medical University Hospital, stool specimens were collected from 1,159 foreign workers between March and July 2001. By the simple sedimentation method, 15 workers were found to be infected with parasites. The overall infection rate was 4.4%. The rate of females (5.1%) was higher than that of males (4.2%). Ten species (7 helminths and 3 protozoa) were found and 8 (7 helminths and 1 protozoa) were pathogenic. Seven cases with *Opisthorchis viverrini* were found. The infection rate of *Strongyloides stercoralis* (1.4%) was the highest > *O. viverrini* (0.6%) ≥ *Giardia lamblia* (0.6%) > *Ascaris lumbricoides* (0.4%) > Hookworm (0.3%) ≥ *Trichuris trichiura* (0.3%) *Endoameba coli* (0.3%) ≥ *Edolimax nana* > *Fasciolopsis buski* (0.1%) ≥ *Enterobius vermicularis* (0.1%).

In April and November, we went to Cheng-Ching Lake, Kaohsiung County, Chung-Cheng Lake, Meinung Town, South Taiwan, Sun Moon Lake, Nantou County, Central Taiwan, and Ming-Teh Reservoir, Miaoli County, North Taiwan to collect *Bithynia* snails belong to the same genus of the first intermediate host of *O. viverrini*. Only 35 empty shells of *Bithynia* snails were collected. However, six other species of freshwater snails were collected: *Sinotaia quadrata*, *Tarebia granifera*, *Thiara scabra*, *Melanoid tuberculata*, *Pomacea canaliculata*, and *P. scalaris*.

In order to conduct the experimental infection, we also collect stool specimens from a couple of cases infected with *O. viverrini*. After filtering by the metal filter method and standstill sedimentation, no eggs were recovered. These findings may be due to the fact that the number of worms infecting these cases was very few and the intensity of eggs was very low. We plan to collect *O. viverrini* eggs from the seven infected persons. Under the assistance of the Taipei Medical University Hospital, the foreign worker mediating companies were acknowledged by letters to inform the seven cases for free chemotherapy to collect adult worms from the stool specimens and eggs from the uterus of the worms. However, this experiment was interrupted because of the uncooperation of the foreign worker mediating companies.

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第一表

泰國外勞寄生蟲之調查資料 (90年3月13日—7月21日)

Survey of imported parasitosis among Thailand laborers in Taiwan

寄生蟲	男 (888) *		女 (271) *		共計 (1,159) *	
	陽性 人數	陽性 %	陽性 人數	陽性 %	陽性 人數	陽性 %
泰國肝吸蟲 ( <i>Opisthorchis viverrini</i> )	6	0.7	1	0.4	7	0.6
糞小桿線蟲 ( <i>Strongyloides stercoralis</i> )	11	1.2	5	2.0	15	1.4
鉤蟲 (Hookworm)	2	0.2	1	0.4	3	0.3
蛔蟲 ( <i>Ascaris lumbricoides</i> )	3	0.3	2	0.7	5	0.4
薑片蟲 ( <i>Fasciolopsis buski</i> )	1	0.1	0	0	1	0.1
鞭蟲 ( <i>Trichuris trichiura</i> )	3	0.3	1	0.4	4	0.3
蟯蟲 ( <i>Enterobius vermicularis</i> )	1	0.1	0	0	1	0.1
梨形鞭毛蟲 ( <i>Giardia lamblia</i> )	5	0.6	2	0.7	7	0.6
大腸阿米巴 ( <i>Endoameba coli</i> )	3	0.3	1	0.4	4	0.3
微小阿米巴 ( <i>Edolimax nana</i> )	2	0.2	1	0.4	3	0.3
計	37	4.2	14	5.2	51	4.4

\*調查人數

第一表

高雄縣澄清湖淡水螺之調查

Survey of freshwater snails in Cheng-Ching Lake Area, Kaohsiung County

淡水螺種別	活淡水螺		死淡水螺		總螺數
	數目	百分率	數目	百分率	
滿州豆（沼）螺（ <i>Bithynia manchourica</i> ）			35	100	35
石田螺（ <i>Sinotaia quadrata</i> ）	92	94	6	6	98
瘤蝸（ <i>Tarebia granifera</i> ）	105	100			105
塔蝸（ <i>Thiara scabra</i> ）	34	92	3	7	37
網蝸（ <i>Melanoid tuberculata</i> ）	25	100			25
福壽螺（ <i>Pomacea canaliculata</i> ）	12	100			12
圓寶螺（ <i>Pomacea scalaris</i> ）	9	100			9
共 計	277	84	54	6	331