IALC Peace Fellowship
Final Report: 15 January – 15 March 2006

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Entomopathogenic Nematodes Diversity in Jordan: An Environmentally-Safe Alternative to Benefit Agriculture in Desert Systems

Thanks to the IALC Wayne Owens Peace Fellowship Program, I had the opportunity to visit the USA, particularly the University of Arizona. I had the honor to be trained and work under the supervision of Dr. Patricia Stock at the Department of Entomology in the field of entomopathogenic nematology. Entomopathogenic nematodes (EPN) can provide effective biological control of several important soil insect pests and other pests that have soil dwelling stages.

My training in Dr. Stock's laboratory was through the collaborative project entitled "Entomopathogenic Nematodes Diversity in Jordan: An Environmentally-Safe Alternative to Benefit Agriculture in Desert Systems" between the USA and Jordan that is funded by IALC. The USA partner is represented by Dr. Patricia Stock, whereas the University of Jordan team is represented by Dr. Luma Al Banna, (co-principal investigator) and collaborators, Dr. Ahmad Khatbeh and Dr. Rula Darwish, with whom I worked.

The objectives of this project are:

1. To isolate and identify EPN and their symbiotic bacteria from soil-inhabiting insects and from the diverse landscape regions from Jordan.

2. To preserve nematodes and EPN symbiotic bacteria cultures for their future use in biocontrol programs, bioprospecting and ecological studies, etc.

3. To evaluate the host range and desiccation tolerance of native EPN strains and species against important pests in Jordan.

4. To evaluate the effects of temperature and soil moisture on infectivity and reproduction of native EPN strains and species.

To meet the goals of such objectives, the Jordanian team conducted an extensive survey throughout Jordan and collected samples from all Jordanian geographic regions. These samples were taken from both natural (non- or less-human-disturbed) and agricultural habitats in each of the selected sampling regions (i.e., the highlands, Jordan valley, and desert region). The soil samples were processed to isolate EPN, insects associated, and other soil nematodes by following different methods. Insects were also collected from the same locations and habitat of soil.

The second phase of this project was the identification of EPN (using classical morphology and molecular methods). The third phase of this project is the ecological & physiological characterization of EPN.

After spending the first year in Jordan actively participating in survey trips, I packed my suitcase to fly to Tucson, Arizona to join Dr. Stock's lab. I spent nine interesting weeks (15 Jan to 15 March 2006) working with and being trained by Dr. Stock . The training part dealt with classical and molecular systematics of the recovered Jordanian EPN (extraction of nucleic acids, polymerase chain reaction methods & preparation of samples for DNA sequencing).

Also, I had the chance to conduct some experiments on the host range, ecological, and physiological experiments including temperature and moisture on infectivity and reproduction of the recovered Jordanian EPN.

For such a visit, it was also very useful and helpful for me to explore the campus life at University of Arizona, and to be in direct contact with a different culture. Besides that, the knowledge I gained from training there was helpful to apply it here in Jordan with our project. My stay at University of Arizona is something unforgettable; I was given a wonderful opportunity through the IALC Wayne Owens Peace Fellowship to live, learn, and work closely in USA.

I would like to express my deepest respect for Dr. Stock for her guidance and hospitality during my stay. I wish to meet her soon in Jordan. Also, my warm greetings for Dr. Stock’s lab members: Joanna, Pavla, Eunhee, Roy, and Chan.

I’m grateful for the sponsorship of the IALC Wayne Owens Peace Fellowship for their generous support.