

# 1. Introduction

It is a pleasure for me to introduce the laboratory's 1999 Annual Report.

The finances of the laboratory did not improve in the course of 1999. So far we have not succeeded in replacing the projects funded under the framework programmes of the Ministry which expire by the end of the year. These projects have yielded many fine results that are now in the process of being published. It is important, however, to establish new funding possibilities in order to keep our expert knowledge.

The laboratory will continue the policy of including Ph.D. students within its research projects, since we see this as an important contribution to the education of scientists.

During 1999 many resources have been used in the preparation of construction plans, and we are now ready to start building an additional 1200 m<sup>2</sup> and renovating 800 m<sup>2</sup>. According to the plans, construction will be carried out by stages so that our level of research activity can be maintained, although some disturbances must be expected.

The new millennium brings the further achievement of IT within the laboratory. As a result the Annual Report is now only published electronically. Based on the number of people currently consulting DPIL Homepage, we do not expect it to cause any problems, but as a precaution it will still be possible to ask for a paper version.

Finally, I would like to thank the Board and the entire staff for their fine cooperation during the past year.

N. Bille

## **2. Management and organization**

### **2.1 Board of the Danish Pest Infestation Laboratory**

#### **Members:**

Niels Ørnbjerg  
Dansk Bilharziose Laboratorium  
Chairman

Lars Damberg  
Danish Pest Infestation Laboratory

Annie Enkegaard  
Danish Institute of Agricultural Services, Flakkebjerg

Peter Esbjerg  
Royal Veterinary and Agricultural University  
Vice-chairman

Lise Stengård Hansen  
Danish Pest Infestation Laboratory

Hans Kristensen  
Danish Agricultural Advisory Centre

Elisabeth Nørbygaard  
Danish Medicines Agency

Peter Weile  
Danish Environmental Protection Agency

Ellis Byrgiel Sommer  
Research Secretariat, Danish Directorate for Development, Observer

## 2.2 Staff 1999

*E-mail addresses for DPIL staff are available on the Web-site*

in Danish: [http://www.dpil.dk/frames/vejv\\_frm.htm](http://www.dpil.dk/frames/vejv_frm.htm)

in English: [http://www.dpil.dk/frames/evejv\\_frm.htm](http://www.dpil.dk/frames/evejv_frm.htm)

### **DIRECTOR**

Nils Bille

### **SECRETARIAT, ACCOUNTS AND BOOKKEEPING**

Inge Børgesen

Maj-Britt Børgesen (from 16.05 until 15.08)

Marianne Christensen (part-time)

Lisbeth Gammelgaard (part-time)

Jette Hansen (part-time)

Ilse Hall Jensen

Kirsten Engell Jørgensen (part-time)

Hanne Olsen

Volker Pieper

### **INFORMATION TECHNOLOGY**

Vibeke Rostgaard Schmidt

### **DEPARTMENT OF ENTOMOLOGY**

#### **Scientists**

Jørgen Brøchner Jespersen (Head)

Lise Stengård Hansen\* (part-time)

Karl-Martin Vagn Jensen\*

Vibeke Kalsbeek (Ph.D. student)

Ole Østerlund Kilpinen

Michael Kristensen\*

Mette Knorr (part-time)

Per Sejerø Nielsen\*

Henrik Skovgård Pedersen\*

Anne Marie Rasmussen (part-time)

Andrew Spencer\*

Tove Steenberg\*

#### **Technicians**

Aase Borges (part-time)

Ulrik Cold (until 30.11)

Lars Damberg

Eva Hald

Henriette Hansen

Nicolai Hansen

Gitte Jensen

Dorthe Kyster

Ib Bjarne Nielsen

Bodil Malle Pedersen (part-time)

Kirsten Peschel  
 Minna Wernegreen (part-time)  
 Mirjana Zibar

## **MAMMAL DEPARTMENT**

### **Scientists**

Herwig Leirs (Head)  
 Thomas Bolbroe (until 28.02)  
 Ann-Charlotte Heiberg (Ph.D. student)  
 Jens Lodal\*  
 Solveig Vibe-Petersen (Ph.D. student)

### **Technicians**

Sarah Adams  
 Kristian Fordsmand (until 30.06)  
 Folmer Jensen  
 Iver Munch Skadborg (from 08.11)

## **TECHNICAL MANAGEMENT**

Jørgen Christensen

\* Senior scientists

## **2.3 Ph.D. and M.Sc. students**

Michael Carlsen, Ph.D. student (University of Aarhus – until 06.05)  
 Ann-Charlotte Heiberg, Ph.D. student (University of Copenhagen)  
 Vibeke Kalsbeek, Ph.D. student (Royal Veterinary and Agricultural University, Copenhagen)  
 Saskia Mercelis, Ph.D. student (University of Antwerp, Belgium)  
 Christian Nansen, Ph.D. student (Royal Veterinary and Agricultural University, Copenhagen)  
 Solveig Vibe-Petersen, Ph.D. student (Royal Veterinary and Agricultural University, Copenhagen)

Ditte Hendrichsen, M.Sc. student (University of Copenhagen)  
 Thomas Lisborg, M.Sc. student (University of Odense)  
 Katrine Mohr, M.Sc. student (University of Copenhagen)  
 Thomas Nørgaard, M.Sc. student (University of Aarhus)  
 Tina Stendal Svendsen, M.Sc. student (University of Copenhagen)

## **2.4 Guest scientist**

As in previous years we have had the pleasure of frequently seeing J. Keiding, Scientist Emeritus.

### 3. International collaboration

#### 3.1 Conferences

J. B. Jespersen participated in the management committee meeting of the Working group on Mange and Myiasis in Livestock, EU Cost Action 833, 25 January, Brussels, Belgium.

S. Vibe-Petersen participated in the NORFA course for Ph.D. students, Rodent Population Dynamics: Pest Control & Environmental Monitoring, Tune, Denmark, 7-13 February. She presented the paper “Predation and population dynamics in African *Mastomys* rats: potential for integrated pest management?”

A. Spencer, J. B. Jespersen and M. Knorr participated in the national “Theme day on Salmonella”, where they presented a paper on “Biller i dansk Fjerkræproduktion: Angrebsniveau, biologi og bekæmpelse”, and “Kan biller overføre Salmonella og Campylobacter mellem to rotationer af slagtekyllinger?”, 7 April, in Foulum, Denmark.

H. Leirs attended the First Project Coordination Meeting for Management of Rodent Pests in Rice-Based Farming Systems in Southeast Asia, 19-21 April, Canberra, Australia. He gave a guest lecture “Age structure differences in *Mastomys natalensis*.”

J. B. Jespersen attended the Third ENMARIA business meeting and a workshop on “Combating insecticide resistance”, 25-29 May, in Thessaloniki, Greece. Together with Ian Denholm he presented a paper entitled “Overview of Insecticide resistance”.

H. Leirs, J. Lodal, M. Carlsen, T. Bolbroe, S. Vibe-Petersen and A. C. Heiberg participated in the Third European Congress of Mammalogy, 29 May-3 June, Jyväskylä, Finland. H. Leirs convened the symposium “Applied ecology and small mammal management”. M. Carlsen gave a lecture entitled “The effects of predation on winter and spring body weights and onset of reproduction in *Microtus agrestis*”. This paper was co-authored by J. Lodal, H. Leirs and T. S. Jensen. S. Vibe-Petersen gave a lecture “Prey dynamics of African rats under different predation pressure”. T. Bolbroe presented a poster “Behavioural response of field voles under mustelid predation risk in the laboratory: more than neophobia.”. A. C. Heiberg presented a poster “Population effects of anticoagulant rodenticide resistance in Norway rats.”

H. Leirs and S. Vibe-Petersen participated in the 8th International Symposium on African Small Mammals, 4-9 July, Paris, France. H. Leirs was a Member of the Scientific Committee, convened the session “African small mammals as pests” and chaired another session “Ecology”. He gave a keynote lecture “The rodent problem in Africa: Challenges for ecologically-based management”. S. Vibe-Petersen presented a lecture “Predation in populations of *Mastomys natalensis*: potential for pest management?” H. Leirs co-authored two posters on “The recolonisation of ‘emptied’ maize fields by rodents: implications for rodent control” and “The bats (Chiroptera) from Kikwit, Democratic Republic of the Congo”.

K.-M. V. Jensen and J. B. Jespersen attended the 3rd International Conference on Urban Pests, where K. M. V. Jensen presented two papers entitled “Interaction between entomopathogenic fungi (Deuteromycotina: hyphomycetes) and the biology of German cockroaches (*Blattella germanica* (L.)) (Dictyoptera: blattellidae)” and “The impact of a single treatment with the chitin synthesis inhibitor lufenuron on German cockroach (*Blattella germanica* (L.)) (dictyoptera: blattellidae) populations”, 19-22 July, in Prague, Czech Republic.

O. Kilpinen and J. B. Jespersen attended the 17th International Conference of the World Association for the Advancement of Veterinary Parasitology, where Ole Kilpinen presented a poster entitled “Effects of the chicken mite *Dermanyssus gallinae* on egg layers”, 15-19 August, in Copenhagen, Denmark.

L. S. Hansen and P. S. Nielsen participated in a meeting in the IOBC working group on “Integrated protection of stored products” in Berlin, Germany, 22-24 August. L. S. Hansen presented a paper entitled: “The effect of *Trichogramma turkestanica* Meyer (Hymenoptera: Trichogrammatidae) on *Ephestia kuehniella* Zeller (Lepidoptera: Pyralidae) in relation to temperature”. P. S. Nielsen presented a paper entitled “IPM in Danish flour mills, present use and limitations”.

M. Kristensen participated in the Seventh Congress of the European Society for Evolutionary Biology, Barcelona, Spain, 23-28 August.

J. B. Jespersen participated in the International Symposium on “Biological Control Agents in Crop and Animal Protection, where he presented a paper on “Methods for biological control of arthropod pests in organic animal husbandry”, 24-28 August, Swansea, UK.

O. Kilpinen participated in Cost Action 833 in Cluj, Romania, 1-3 September, presenting a talk “Problems caused by the chicken mite, *Dermanyssus gallinae*, in the Danish egg production”.

H. Leirs, J. Lodal and A. C. Heiberg participated in the 2nd European Vertebrate Pest Management Conference, 6-8 September, Braunschweig, Germany. A. C. Heiberg gave a lecture and presented a poster on “Population effects of anticoagulant rodenticide resistance in Norway rats”. H. Leirs convened the symposium “Anticoagulant Rodenticide Resistance” and became member of the permanent Steering Committee for the European Vertebrate Pest Management Conference. J. Lodal presented a paper entitled “Distribution and levels of anticoagulant resistance in rats (*Rattus norvegicus*) in Denmark”.

H. Leirs attended the meeting of the European Research Network for Control of Viral Hemorrhagic Fevers, 9-11 September, Fondation Mérieux, Lyon, France.

H. Leirs and S. Vibe-Petersen participated in the Symposium “Dynamics in time and space: basic and applied issues”, Norwegian Academy of Science and Letters, 15-17 September, Oslo, Norway. H. Leirs gave an invited lecture: “The population dynamics of the multimammate rat in Africa”.

J. B. Jespersen and H. Skovgaard participated in the NJF Seminar No. 303: Ecological Husbandry in the Nordic Countries, where J. B. Jespersen presented a paper entitled “Arthropod pest problems in organic animal husbandry and methods for their control”, 16-17 September, Horsens, Denmark.

J. B. Jespersen participated in the Meeting of the FAO Working Group on Parasite Resistance and the FAO/INDUSTRY Contact Group Meeting, 20-25 September, Juiz de Fora, Brazil.

### **3.2 Visits and co-operation**

#### **DPIL staff paid visits to the following countries:**

20 October 1998–19 May 1999, S. Vibe-Petersen visited Sokoine University of Agriculture (SUA), Rodent Research Unit, Morogoro, Tanzania. She visited SUA again from 22 October 1999 for a scheduled stay until 30 May 2000. Both stays were related to her Ph.D. project.

21 March–2 April, H. Leirs visited Cyprus as a short-term consultant for the World Health Organisation (EMRO-Alexandria), advising the Government of Cyprus on the development of a national plan for rodent control.

8-16 and 23-28 April, H. Leirs visited the Sokoine University of Agriculture, Morogoro, Tanzania, in the framework of several ongoing rodent projects there.

April-May, C. Nansen spent a month at the Department of Entomology, Oklahoma State University, U.S.A. where Dr. Thomas Phillips taught him basic gaschromatography techniques as tools for studies of insect semiochemicals.

14-22 May, H. Leirs travelled to Durba, Democratic Republic of the Congo, as a consultant for the World Health Organisation for ecological research during the Marburg epidemic outbreak.

19-20 May, N. Bille, J. B. Jespersen, K.-M. V. Jensen and J. Lodal visited Umweltbundesamt, Institut für Wasser, Boden und Lufthygiene, Berlin, Germany, to discuss resistance to pesticides in insects and rodents, guidelines for testing of household insecticides and the EU-Biocide directive.

3-8 June, H. Leirs, T. Bolbroe, S. Vibe-Petersen and A. C. Heiberg visited the Biological Stations at Kilpisjärvi and Pälläsjärvi, Finland, and participated in small mammal trapping there.

22 October–22 December, K. Mohr visited the Sokoine University of Agriculture, Morogoro, Tanzania, to carry out the field work for her M.Sc. thesis.

H. Leirs visited the University of Antwerp (Belgium) and the University of Oslo (Norway) several times in the framework of collaborative projects.

### **DPIL was visited by the following colleagues and other guests:**

11-13 January, DPIL hosted the coordination meeting for the ISTC-project K-159 “Monitoring plague foci in Kazakstan”. The meeting was attended by Prof. A. A. Ashimov, Prof. Svetlana Sokolova (Institute for Informatics and Control Problems, Almaty, Kazakhstan), Dr. V. Aikimbayev, Dr. V. Ageyev, Dr. S. Pole (Kazakh Anti-Plague Research Institute, Almaty, Kazakhsta), Dr. E. Carniel (Institut Pasteur, Paris), Prof. N. C. Stenseth (University of Oslo), Dr. H. Henttonen (Finnish Forestry Research Institute, Helsinki), Dr. M. Pletschette, Prof. N. Bounaga (European Commission DGXII, Brussels), K. S. Larsen (KSL Consulting, Denmark) and N. Bille, H. Leirs, O. Kilpinen (DPIL).

15 February, Dr. Grant Singleton, CSIRO Division of Wildlife and Ecology, Canberra, Australia to discuss rodent management research and give a lecture on immunocontraception in wildlife control.

15-17 February, Apia Massawe, Sokoine University of Agriculture, Morogoro, Tanzania, to discuss her Ph.D. project on rodent ecology in different Tanzanian maize field types.

20 February-7 March, Dr. Elias Papadopoulos, Thessaloniki, Greece, on training visit on insecticide resistance.

19-23 April, Kjersti Hovde Christensen, Oslo, Norway on training visit on insect breeding methods and insecticide test techniques.

20 April, we were visited by a group from the Swedish pest control company Anticimex.

11-21 May and 7-14 June, Dr. Jan-Erik Bergh, Dalarna University College, Sweden, conducting investigations for a project on modified atmospheres and museum pests.

11 August, Dr. Ian Denholm, IACR Rothamsted, UK, to discuss ENMARIA business matters.

18 August, Professor A. Liebisch, Hannover, Germany, to discuss insect vector control.

1-3 September, DPIL hosted a coordination meeting to prepare an international collaborative project on rodents and pests in staple crops. The meeting was attended by Dr. R. H. Makundi (Sokoine University of

Agriculture, Morogoro, Tanzania), Dr. N. Oguge (Kenyatta University, Nairobi, Kenya), A. Sichilima (Ministry of Agriculture, Solwezi, Zambia), Prof. Dr. R. Verhagen (University of Antwerp, Belgium), Prof. Dr. N. C. Stenseth (University of Oslo, Norway) and H. Leirs, S. Vibe-Petersen (DPIL).

3 September, Professor G. Hoffmann, Umweltbundesamt, Institut für Wasser, Boden und Lufthygiene, Berlin, Germany, to discuss biology and control of insects of public health importance.

7-8 October, Dr. P. Chapman, CSL, York, UK to prepare common application for the EU 5th Framework Programme.

7 October, a group of eight scientists from Vietnam to hear a lecture on IPM in stored products by P. S. Nielsen and a lecture on rodent control by H. Leirs.

11 November, Dr. K. L. Heong, International Rice Research Institute, Laguna, Philippines, to discuss potential future collaborative projects.

23–30 November, Dr. Koné A. Blaise, National Institute of Public Hygiene, Abidjan, Cote D'Ivoire, to obtain training on insecticide resistance test techniques and breeding of flies and cockroaches.

2-3 December, Dr. Jutta Hermann and Renata Taskin, Umweltbundesamt, Institut für Wasser, Boden und Lufthygiene, Berlin, Germany, to discuss testing of insecticides and implementation of the EU Biocidal Directive.

### **3.3 WHO Collaborating Centre and Expert Panel**

DPIL is a "WHO Collaborating Centre on Pesticide Resistance". The terms of reference are:

1. To study insecticide resistance developments in flies, cockroaches and rodents, and to establish discriminating concentrations/exposure times to different pesticides used for the control of these pests.
2. To maintain strains of susceptible and resistant colonies for the above studies and serve as a reference centre providing material from the above colonies for other WHO collaborators.
3. To study how to overcome resistance problems caused by the above-mentioned pests through delay approaches, alteration, change of control methods or a combination of methods.

Much of the work summarized in the section "Scientific and technical work" fulfils the terms of the centre.

Since 1991 J. B. Jespersen has been a member of the WHO Expert Advisory Panel on Vector Biology and Control, and in 1996 he accepted an invitation to serve as a member for a further period of four years.

### **3.4 FAO Expert Panel on Resistance in Parasites in Livestock**

In 1998 J. B. Jespersen became a member of the FAO Panel of Experts on Resistance in Parasites in Livestock. In 1999 he participated in a Working Group Meeting and a joint FAO/Industry Contact Group Meeting, 20-25 September, Juiz de Fora, Brazil.

### **3.5 Scientific and Environmental Monitoring Group (SEMG)**

In 1985 the European Commission formed the SEMG to monitor the application of insecticide in the Regional Tsetse and Trypanosomiasis Control Programme (RTTCP) on Malawi, Mozambique, Zambia and Zimbabwe. In 1992 the mandate of SEMG expanded to include other effects of tsetse control with regard to land use and other possible environmental effects. In addition the activities of SEMG were not to be

restricted to just RTTCP, but could now also involve all other EDF-funded projects in Africa. In 1997 the role and mandate of the SEMG were reviewed again. The mission of SEMG is now to support the European Commission, its member states and partners in the development and implementation of socially, economically and environmentally sustainable livestock production systems for agriculture. At a meeting in Brussels on September 23-24, 1997, the new terms of references were discussed, agreed upon, and referred to the member states.

J. B. Jespersen has been the Danish member of SEMG since 1988.

### **3.6 ENMARIA: European Network for the Management of Arthropod Resistance to Insecticides and Acaricides**

ENMARIA (European Network for the Management of Arthropod Resistance to Insecticides and Acaricides), a new EU-funded Concerted Action, was launched in November 1996 to promote the development and implementation of management strategies for insecticide and acaricide resistance throughout Europe, thereby minimizing reliance on these chemicals and avoiding their increased use following resistance outbreaks. Nominated participants in ENMARIA include scientists and advisors from 13 countries and the agrochemical industry's Insecticide Resistance Action Committee (IRAC). ENMARIA hopes to achieve progress in four main areas - compilation of a European resistance database, workshops, training visits and publicity.

The database will detail all individuals and institutions engaged in insecticide and acaricide resistance research activities and all available information on the incidence, impact and management of resistance in EU and EFTA countries. It will also include information on insect strains (especially susceptible reference strains) cultured by different laboratories that could be shared to save unnecessary duplication of effort.

The workshops will aim at developing and promoting standardized methods for detection and monitoring of resistance and at identifying and disseminating guidelines for its management. The first workshop was held at IACR-Rothamsted in April 1997, in conjunction with the Resistance '97 International Conference on Pesticide Resistance. The second workshop took place in Almería in southern Spain in May 1998, whereas the third workshop took place in Thessaloniki, Greece in May 1999. Difficulties encountered in these regions with insect and mite control encapsulate well the need to integrate resistance management tactics with non-chemical approaches and are relevant to protected horticulture and agriculture throughout Europe.

ENMARIA sponsors technical training visits, focusing on techniques for monitoring resistance and evaluating resistance. Until now 10 such training visits have been funded.

The primary long-term objective of ENMARIA is to encourage close and formal scientific collaboration on resistance research between European laboratories, thereby avoiding duplication of effort and expertise. In addition, ENMARIA will remain committed to creating an environment more favourable for the implementation of resistance management strategies, notably by promoting open and frequent dialogue between researchers, pest management advisors, the agrochemical industry and regulatory authorities.

Involvement in ENMARIA is open to all interested individuals and organizations; further details are available from the main coordinators whose details are as follows:

Dr. Jørgen B. Jespersen  
Danish Pest Infestation Laboratory  
Skovbrynet 14  
DK-2800 Kgs. Lyngby  
Denmark  
Tel.: (45) 45 87 80 55  
Fax: (45) 45 93 11 55

Dr. Ian Denholm  
IACR-Rothamsted  
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ENMARIA has established a Website giving information about its activities. The Homepage includes logos, maps and details of participants, and the site will eventually include working papers prepared by national representatives reviewing resistance problems in their respective countries. The address is:

<http://www.res.bbsrc.ac.uk/enmaria/>

### **3.7 Mange and Myiasis in Livestock in Europe**

As part of the European co-operation in the field of scientific and technical research, a European Concerted Action 833 on Mange and Myiasis in Livestock was established in 1998 with the following objectives:

1. To develop accurate means of diagnosis of mange and myiasis in livestock and so prevent suffering and improve animal welfare.
2. To develop effective and environmentally sensitive methods of treatment and control of these diseases and so increase economic performance and decrease pressure on the environment.
3. To increase the epidemiological knowledge of these diseases in order to facilitate control and eradication programmes.

Altogether, 16 countries are involved in implementation of the COST Action 833, which is organized by the Management Committee. In 1998 J. B. Jespersen was appointed the Danish representative of the Management Committee. In 1999 J. B. Jespersen participated in one Management Committee meeting. Ole Kilpinen participated in the Second Annual Workshop, 2-3 September, in Cluj-Napoca, Romania.

### **3.8 EPPO (European and Mediterranean Plant Protection Organization)**

As from October 1994 J. Lodal has become a permanent member of the EPPO Rodent Control Panel.

## 4. Educational activities

### 4.1 Training courses

In February and March nine one-day courses for personnel using phosphine-generating pellets for the control of moles and water voles were run by J. Lodal in various parts of the country. A total of 725 persons participated.

7-13 February, the laboratory hosted a NorFA (Nordisk Forskerutdanningsakademi) researcher course “Rodent population dynamics: pest control and environmental monitoring” at Tune Landboskole, with 27 Ph.D. students and 12 teachers from 14 countries. The course was organized by H. Leirs in collaboration with N. C. Stenseth (Oslo), H. Henttonen (Helsinki) and L. Hansson (Uppsala).

21-22 September a course on biology and control of insects, mites and rodents was run for military personnel intended to operate in foreign countries (L. S. Hansen, K.-M. V. Jensen, M. Kristensen and J. Lodal).

### 4.2 Lectures

20 January, J. B. Jespersen and H. Leirs gave lectures in a course on “Tropical Medicine” for senior military health staff, intending to operate in foreign countries.

26 January and 20 April, J. Lodal gave lectures on rat resistance to anticoagulants at an Authorization Course in Rat Control held by the Ministry of the Environment, Copenhagen.

11 March, L. S. Hansen gave two lectures on “Pests related to storage and production of food” for food technology students at the Royal Veterinary and Agricultural University, Copenhagen.

15 April, J. Lodal gave a lecture on the present situation of resistance to anticoagulants in the brown rat in Denmark at a meeting of Brancheforeningen for Kommunal Skadedyrbekæmpelse (an association of pest control companies involved in municipal pest control).

4 May, J. B. Jespersen gave two lectures on “Flies and mosquitoes” for students at the Royal Veterinary and Agricultural University, Copenhagen

18 May, L. S. Hansen gave a lecture on “Biology and control of seed destroying pests” for a group of students from developing countries participating in a course on seed pathology at the Plant Directorate.

27 May, A. Rasmussen gave a lecture on a questionnaire investigation on headlice for the participants in a Nordic lice conference.

1 October, H. Leirs, J. B. Jespersen, A. Spencer, K.-M. V. Jensen and P. S. Nielsen gave lectures to students in international health visiting DPIL.

1 and 15 October, L. S. Hansen gave two lectures on “Physical and other non-chemical methods for the control of pests in museums” at the Royal Danish Academy of Fine Arts – School of Conservation, Copenhagen. N. Bille and K.-M. V. Jensen gave lectures as well.

7 October, a group of eight scientists in plant protection from Vietnam visited the laboratory. P.S. Nielsen gave a lecture on IPM in stored products, H. Leirs gave a lecture on “Protecting stored grain against rats”.

### 4.3 External examiner and reviewer duties

L. S. Hansen served as external examiner for forestry students in forest entomology and ecology at the Royal Veterinary and Agricultural University, Copenhagen.

L. S. Hansen served as external supervisor for Ph.D. student C. Nansen, the Royal Veterinary and Agricultural University, Copenhagen.

A.-C.Heiberg served as referee for Crop Protection and Advances in Vertebrate Pest Management.

J. B. Jespersen served as external examiner for two Ph.D. students at the Royal Veterinary and Agricultural University, Copenhagen, and for one student at the Danish Bilharziasis Laboratory, Charlottenlund.

J. B. Jespersen served as supervisor for one M.Sc. student and one Ph.D. student at the Royal Veterinary and Agricultural University, Copenhagen, one M.Sc. Student at Roskilde University, Roskilde, and one student at the Technical University of Denmark, Kgs. Lyngby.

M. Kristensen served as a referee for the Advances in Vertebrate Pest Management.

H. Leirs served as a supervisor for one Ph.D. student at the Royal Veterinary and Agricultural University, Copenhagen, one Ph.D. student at the University of Copenhagen, one Ph.D. student at the University of Antwerp (Belgium), two Ph.D. students at the Sokoine University of Agriculture, Morogoro (Tanzania).

H. Leirs served as adviser to one M.Sc. student at the University of Copenhagen, one M.Sc. student at the University of Aarhus and one M.Sc. student at the University of Oslo (Norway). He also regularly advised students at the Royal Veterinary and Agricultural University, Copenhagen.

H. Leirs served as external examiner for one M.Sc. thesis at the Faculty of Science, University of Dar es Salaam, Tanzania.

H. Leirs served as Associate Editor for *Mammalia* (Paris).

H. Leirs served as referee for *Mammalia Journal of Zoology*, Pesticide Science, Biodiversity and Conservation, Tropical Zoology, Polish Journal of Ecology, Advances in Vertebrate Pest Management; as editor of a multi-authored book published in 1999, he reviewed and commented on several contributions.

H. Leirs served as a reviewer for several foreign institutes and funds.

J. Lodal served as a supervisor for one Ph.D. student, University of Aarhus.