



Prof. Johan Spies

Department of Genetics

Overview

The Department of Genetics was re-established as an independent department on 1 October 2007, after having been a division of the Department of Botany and Genetics (1989-2001) and then a division of the Department of Plant Sciences (2002-2007). Prof. Johan Spies was elected as the first Chairperson of the new department.

The mission of the department is to acquire and disseminate knowledge on Genetics to the benefit of all. This is done by research, tuition at under- and postgraduate levels, and by community service.

During 2007 Mr Frank Maleka joined the department as Lecturer in Molecular Genetics. He completed his M.Sc. thesis at the University of Pretoria (UP) under the guidance of Profs Zander Myburg and Paulette Bloomer.

Staff members were active in various organisations. Prof. Spies is president of the South African Genetics Society and Chairperson of the Clivia Society. Prof. Paul Grobler acts as Adjunct Associate Professor for the Department of Fisheries and Wildlife Sciences at Virginia Tech in Blacksburg, United States of America (USA). He is also a council member of the Southern African Wildlife Management Association (SAWMA).

Prof. Antoinette Kotze is a council member of SAWMA, chairperson of the African Association of Zoos and Aquariums Research and Monitoring Working Group, chairperson of the National Zoological Gardens of South Africa Research and Ethics Committee, serves on the board of directors of the Mabula Ground Hornbill Research and Conservation Project, steering committee member of the South African Biodiversity Information Facility, member of the National Cheetah Conservation Forum and member of the management of the Vulture Conservation Programme.

Various national and international congresses were attended during the year. On international level, Prof. Spies delivered the keynote address at the Annual General Meeting of the Clivia Society. Six of his postgraduate students also attended the meeting. The Annual Meeting of the Society for Conservation Biology (SCB), which was held at the Nelson Mandela Metropolitan University in Port Elizabeth, was attended by Profs Grobler and Kotze. Prof. Kotze also attended the 6th Inter-

national Zoo and Wildlife Research Conference on Behaviour, Physiology and Genetics in Berlin, Germany.

On national level, Profs Grobler and Kotze attended the Annual Meeting of SAWMA at Didima Camp in the Drakensberg Reserve where they chaired sessions. Prof. Kotze also attended the 18th Annual Conference of the African Association of Zoos and Aquariums at Plettenberg Bay and the 2nd Conference of the Animal Keepers Association of Africa at Ushaka Seaworld, Durban, where she was an invited speaker.

Research on *Lachenalia* resulted in an invitation to Ms Paula Spies, a doctoral student in the department, to present a paper at the fourth Monocot Symposium during 2008. This paper will conclude the research on *Lachenalia*. A study on genetic diversity in different *Clivia* species and the possible application of these results in forensics, is currently being conducted. Research on the genes involved in the formation of flower colour in *Clivia* is also progressing well.

The animal genetics team of Profs Grobler, Kotze and Ms Karen Ehlers is conducting a number of projects, including the following:

- A project that aims to investigate the nature and extent of hybridization between blue- and black wildebeest in South Africa (in collaboration with the University of Pretoria, the National Zoological Gardens (Pretoria);
- the National Museum (Bloemfontein), and conservation officers from the Free State and KwaZulu-Natal), a DNA profiling of black rhino in the Weenen Game Reserve (together with Ezemvelo KZN Wildlife), the genetic management of baboon populations (in collaboration with the Gauteng Department of Agriculture);
- a national genetic database for cheetah (in collaboration with the National Zoological Gardens, Pretoria, the Department of Genetics at the UP, the De Wildt Cheetah and Wildlife Trust, and the Hillsdale College, USA), population management of crane species (in collaboration with the National Zoological Gardens, Pretoria; and
- the Endangered Wildlife Trust), genetic and population studies on ground hornbills (in collaboration with the National Zoological Gardens, Pretoria, and the Endangered Wildlife Trust, Ground Hornbill Working Group.

Staff

Professor: Prof. Johan Spies

Associate Professor: Prof. Paul Grobler

Affiliated Associate Professor: Prof. Antoinette Kotze

Lecturers: Dr Adèle Strydom, Ms Karen Ehlers, Mr Frank Maleka

Professional Officer: Ms Susan Reinecke

Administrative Officer: Ms Beverley Henn

Contact details

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Prof. Johan Spies (left), Departmental Chairperson, in conversation with Mr Willem Froneman, Director of the Lowveld National Botanical Garden, Nelspruit.



Prof. Trudy Turner (left) of the University of Wisconsin-Milwaukee, United States of America (USA) and Ms Letecia Jonker, M.Sc. student of the department, busy with measurements and collection of material from a sedated vervet monkey.

Other projects by the animal genetics team are: The Mabula Ground Hornbill Research and Conservation Project, (UP), the compilation of an atlas for haemoglobin profiles in wildlife (in collaboration with BIORAD, Germany, SANParks, and the University of Limpopo), white rhino conservation and genetics (in collaboration with the Mpumalanga Tourism and Parks Agency), genetic variation in freshwater mussels from Botswana and an investigation of the geographic genetic structure among vervet monkeys populations, to regulate the release of monkeys from

sanctuaries (University of Wisconsin-Milwaukee, USA).

Prof. Trudy Turner of the Department of Physical Anthropology at the University of Wisconsin-Milwaukee, USA, visited the department in February and again in July 2007. During the February visit she presented a seminar and conducted a joint field trip with Prof. Grobler and postgraduate students, to collect vervet monkey samples near Kimberley. In July she accompanied Prof. Grobler and another group of postgraduate students to sample vervet monkeys in the Upington area.

Another visitor to the department was Mr Jess Jones of the Department of Fisheries and Wildlife Sciences at Virginia Tech, Blackburg, USA. Mr Patrick Schwab from the University of Kiel in Germany also visited the department.

Prof. Spies acts as information officer for the distribution of knowledge obtained during the research of *Clivia* and handles many enquiries from *Clivia* breeders. Prof. Grobler presented in-service training to agricultural educators (teachers) in the province, to improve knowledge on basic and applied genetics.

Research outputs

Research articles

Kinahan, A.A., Ingle-Moller, R., Bateman, P.W., Kotze, A. & Scantlebury, M. 2007. Body temperature daily rhythms and adaptations in African savanna elephants (*Loxodonta africana*). *Journal of Physiology & Behaviour* 92: 560-565.

Strydom, A., Kleynhans, R. & Spies, J.J. 2007. Amaryllidaceae: Chromosome studies on African plants 20: Karyotypes of some *Cyrtanthus* species. *Bothalia* 36: 103-108.

Chapters in books

Hallerman, E.M., Grobler, J.P. & Jones, W.J. 2007. Application of DNA markers for population genetic analysis. In *Aquaculture Genome Technologies*, edited by J. Liu. Ames, Iowa (USA): Blackwell Publishing. pp. 109-136.

Conference contributions

Grobler, J.P., Kotze, A., Ehlers, K., Bloomer, P., Rushworth, I., Brink, J. & Vrahimis, S. 2007. Hybridization between black- and blue wildebeest (*Connochaetes gnou* and *C. taurinus*): Approaches to the genetic management of sympatric congeners. Poster presented at the 21st Annual International Meeting of the Society for Conservation Biology (SCB), Nelson Mandela Metropolitan University, Port Elizabeth, South Africa. 1-5 July.

Ingle-Moller, R., Kinahan, A. & Kotze, A. 2007. The use of captive African savanna elephants at the National Zoological Gardens of South Africa to determine temperature regulation. Paper presented at the 18th Annual Conference of the African Association of Zoos & Aquaria (PAAZAB), Plettenberg Bay, South Africa. 30 May-1 June.

Jones, J., Grobler, J.P., Neves, R. & Hallerman, E.M. 2007. Complex patterns of genetic variation in freshwater mussels (*Bivalvia: Unionidae*) of the United States: implications for conservation genetic studies. Poster presented at the 21st Annual International Meeting of the Society for Conservation Biology (SCB), Nelson Mandela Metropolitan University, Port Elizabeth, South Africa. 1-5 July.

Kleynhans, R., Spies, J.J. & Spies, P. 2007. Cross-ability in the genus *Lachenalia*. Paper presented at the 6th International Symposium on New Floriculture Crops, Madeira, Portugal. 11-15 June.

Kotze, A. 2007. Community-based research approaches to biodiversity conservation. Keynote address presented at the Gauteng Nature Conservation Research Symposium, Suikerbosrand Nature Reserve, Gauteng, South Africa. 15-16 November.

Kotze, A. 2007. The importance of research in animal facilities. Invited paper presented at



Prof. Paul Grobler, Associate Professor at the department, busy collecting material from a vervet monkey as part of a study on phylogeography of vervet monkeys.

the 2nd Conference of the Animal Keepers Association of Africa, Ushaka Seaworld, Durban, South Africa. 14-15 August.

Kotze, A., Grobler, J.P. & Ehlers, K. 2007. An investigation of the origin of cheetah translocated into South Africa. Poster presented at the 21st Annual International Meeting of the Society for Conservation Biology (SCB), Nelson Mandela Metropolitan University, Port Elizabeth, South Africa. 1-5 July.

Kotze, A., Grobler, J.P., Ehlers, K., Bloomer, P., Rushworth, I., Brink, J. & Vrahimis, S. 2007. Wildebeest hybridization in South Africa. Paper presented at the 6th International Zoo and Wildlife Research Conference on Behaviour, Physiology and Genetics, Berlin, Germany. 7-10 October.

Lane, E.P., Kotze, A., Espie, I. & Bartels, P. 2007. Wildlife disease monitoring at the National Zoological Gardens, South Africa. Paper presented at the 25th Annual Meeting of the European Society for Veterinary Pathology, Munich, Germany. 29 August - 1 September.

Lane, E.P., Michel, A., Espie, I., Gey van Pittius, N.C. & Kotze, A. 2007. Case report: *Mycobacterium xenopi* mesenteric lymph node adenitis in an adult Black and White Ruffed Lemur (*Varecia variegata*). Poster presented at the 25th Annual Meeting of the European

Society for Veterinary Pathology, Munich, Germany. 29 August - 1 September.

Reiter, B., Lekgethisho, D., Kotze, A. & York, D. 2007. Genetics and zoos: An overview of the Genetics Unit of the National Zoological Gardens of South Africa. Paper presented at the 18th Annual Conference of the African Association of Zoos & Aquaria (PAAZAB), Plettenberg Bay, South Africa. 30 May - 1 June.

Schwab, P., Witt, T., Hartl, G. & Grobler, J.P. 2007. Genetic diversity in South African impala (*Aepyceros melampus*). Poster presented at the 21st Annual International Meeting of the Society for Conservation Biology (SCB), Nelson Mandela Metropolitan University, Port Elizabeth, South Africa. 1-5 July.

Spies, J.J. 2007. Clivia research at the University of the Free State. Keynote address presented at the Annual General Meeting of the Clivia Society, Bloemfontein, South Africa. 12 May.

Turner, T., Lorenz, J., Whitten, P., Jacquier, M., McAuliffe, K., Beller, D. & Grobler, J.P. 2007. Genetics, taxonomy and conservation of vervet monkeys in South Africa. Poster presented at the 21st Annual International Meeting of the Society for Conservation Biology (SCB), Nelson Mandela Metropolitan University, Port Elizabeth, South Africa. 1-5 July.