

# PROFESSOR ROUVAY ROODT-WILDING



### **Biography**

Rouvay Roodt-Wilding obtained her PhD in Genetics in 2003 from the University of the Free State. In 2004, she joined Stellenbosch University where she established the Molecular Breeding and Biodiversity Research Group in the department of Genetics. She is currently an Associate Professor in the department of Genetics involved in teaching Introductory Genetics at second year level. She is also the academic coordinator of the Honours class. Her research focuses mainly on molecular population genetics and molecular breeding of various commercially important species including fish, livestock and plants. Ten postdoctoral students, 16 MSc, 8 PhD and 22 honours students have worked and graduated under her supervision the past 14 years.

#### Research area

The Molecular Breeding and Biodiversity Research Group was established in 2004 with the aim of acting as service provider of choice to the South African aquaculture industry. This was realised with a grant from Innovation Fund trust of South Africa to apply genetic improvement in the South African abalone. Subsequently the research group has built up expertise in molecular population genetics, development of microsatellite and SNP markers by means of traditional and next generation sequencing techniques, microsatellite and SNP data analysis and parentage and pedigree analysis. The group is also involved in molecular breeding including linkage mapping and QTL mapping of economically important traits. This has lead to various projects on not only commercially important fish species including abalone (Haliotis midae), kob (Argyrosomas japonicus and A. inododrus) and yellowtail (Seriola lalandi) but also important crop species such as apples, pears, peaches, apricots, grapevine as well as emerging species such as honeybush.

#### **Students**

#### **PhD Students**

**Khethani Mhlembe** PhD 2016 – current. Understanding the molecular genetics of the novel acyanic phenotype in apple. *Joint project with ARC, Infruitec* 

**Thomson Sanudi** 2014 – current. Genetic characterization and selection in lake Malawi *Oreochromis shiranus* towards sustainable aquaculture development and biodiversity management. (co-promoter)

**Carl Horstman** 2013 – current. Molecular genetic studies of selected agronomic traits in apricot, plum and related *Prunus* species. *Joint project with ARC, Infruitec* 



**Jessica Vervalle** 2013 – current. Molecular mapping of quality traits in table grape breeding. *Joint project with ARC, Infruitec* 

**Solomon Ntladi** 2012 – current. Mapping of agronomic traits in European pear (*Pyrus communis*). *Joint project with ARC, Infruitec* 

#### **MSc Students**

**Marissa Brink** MSc 2017 – current. Genetic diversity and disease studies in the sea urchin, *Tripneustes gratilla* 

**Riana van Deventer** MSc 2017 – current. High throughput SNP discovery and genotyping in blue wildebeest, *Connochaetes taurinus*, using next-generation-sequencing

**Tassin Jackson** MSc 2017 – current. Linkage mapping in Dusky kob *Argyrosomus japonicus* (Co-supervisor)

**Thembeka Nyawo** 2014 – current. Molecular fingerprinting and characterisation of the ARC's apricot and plum genebanks. *Joint project with ARC, Infruitec* 

**Lawrence Kwalimba** 2014 – current. Molecular fingerprinting and characterisation of the ARC's peach genebanks. *Joint project with ARC, Infruitec* 

### Selected publications

- R. Dale Kuys, J. Vervalle, R. Roodt-Wilding, C. Rhode. 2017. Genetic association analysis of candidate loci under selection with size in the South African abalone.
   Aquaculture International DOI 10.1007/s10499-016-0107-9
- C. Rhode, A.E. Bester-van der Merwe, R. Roodt-Wilding. 2017. An assessment of spatio-temporal genetic variation in the South African abalone (Haliotis midae), using SNPs: Implications for conservation management. Conservation Genetics 18: 17 31
- B. Picone, C. Rhode, R. Roodt-Wilding. 2017. Identification and characterization of miRNAs transcriptome in the South African abalone, *Haliotis midae*. Marine Genomics 31: 9 12
- B. Picone, C. Rhode, R. Roodt-Wilding. 2016. Evaluation of de novo assembly technique in the South African abalone *Haliotis midae* transcriptome: A comparison from Illumina and 454 systems. **Genomics Data. 2016 10: 165 166**
- B.L. Swart, A.E. Bester-van der Merwe, S.E. Kerwath, R. Roodt-Wilding. 2016.
  Phylogeography of the pelagic fish Seriola lalandi at different scales: confirmation of inter-ocean population structure and evaluation of southern African genetic diversity. African Journal of Marine Science 38: 513 528
- A. Roux, H. Lambrecht, R. Roodt-Wilding. 2016. Laboratory-scale evaluation of the potential of chemical containment for farmed abalone larval escapees.
   African Journal of Marine Science 38: 275 – 278
- L. Sandenbergh, S.W.P. Cloete, R. Roodt-Wilding, M.A. Snyman, A.E. van der Merwe. 2016. Evaluation of the OvineSNP50 chip for use in four South African sheep breeds. South African Journal of Animal Science 46: 89 – 93
- S.N. Maduna, C. da Silva, S.P. Wintner, R. Roodt-Wilding, A.E. Bester-van der Merwe. 2016. When two oceans meet: Regional population dynamics of an exploited coastal shark *Mustelus mustelus*. Marine Ecology Progress Series 544: 183 – 196



- L. Mirimin, B. Macey, S. Kerwath, S. Lamberth, A.E. Bester-van der Merwe, P. Cowley, P. Bloomer, R. Roodt-Wilding. 2016. Genetic analyses of overfished silver kob *Argyrosomus inodorus* (Scieanidae) stocks along the southern African coast. Fisheries Research 176: 100 106
- L. Mirimin, S. Kerwath, B. Macey, S. Lamberth, A.E. Bester-van der Merwe, P. Cowley, P. Bloomer, R. Roodt-Wilding. 2016. Genetic analyses reveal declining trends and low effective population size in an overfished South African sciaenid species, the dusky kob (*Argyrosomus japonicus*). Marine and Freshwater Research 67: 266 276
- L. Sandenbergh, S.W.P. Cloete, R. Roodt-Wilding, M.A. Snyman, and A.E. Van der Merwe. 2015. Genetic diversity and population structure of four South African sheep breeds. Proceedings of the Conference of the Association for the Advancement of Animal Breeding and Genetics 21: 294 297
- D.N. Bitalo, S.N. Maduna, C. da Silva, R. Roodt-Wilding, A.E. Bester-van der Merwe. 2015. Differential gene flow patterns for two commercially exploited shark species, tope (*Galeorhinus galeus*) and common smoothhound (*Mustelus mustelus*) along the south-west coast of South Africa. **Fisheries Research** 172: 190 – 196
- B.L. Swart, A.E. van der Merwe, S. von der Heyden, R. Roodt-Wilding. 2015.
  Molecular systematics and biogeography of the circumglobally distributed genus Seriola (Pisces: Carangidae). Molecular Phylogenetics and Evolution 93: 274 280
- L. Mirimin, N, Kitchin, N.D. Impson, P.F. Clark, J. Richards, S. Daniels, R. Roodt-Wilding. 2015. Genetic and morphologic characterization of *Caridina africana* (Kingsley, 1882) reveals the presence of alien shrimps in the Cape Floristic Region, South Africa. **Journal of Heredity 106: 711 718**
- B. Picone, C. Rhode, R. Roodt-Wilding. 2015. Domain repeats related to innate immunity in the South African abalone, *Haliotis midae*. Marine Genomics 23: 41 43
- B. Picone, C Rhode, R Roodt-Wilding. 2015 Transcriptome profiles of wild and cultured abalone. **Marine Genomics 20: 3 6**
- L. Mirimin, R. Roodt-Wilding. 2015. Testing and validating a modified CTAB DNA extraction method to enable molecular parentage analysis of eggs and larvae of an emerging South African aquaculture species, the dusky kob (*Argyrosomus japonicus*). Journal of Fish Biology 86: 1218 1223
- S.N. Maduna, C. Rossouw, R. Roodt-Wilding, A.E. Bester-van der Merwe. 2014. Microsatellite cross-species amplification and utility in Southern African elasmobranchs: A valuable resource for fisheries management and conservation. **BMC Research Notes 7: 352**
- L. Mirimin, S.E. Kerwath, M.B. Macey, A. Bester-van der Merwe, S.J. Lamberth, P. Bloomer, R. Roodt-Wilding. 2014. Identification of naturally occurring hybrids between two overexploited sciaenid species along the South African coast.
  Molecular Phylogenetics and Evolution 76: 30 33
- C. Rhode, S.N. Maduna, R. Roodt-Wilding, A.E. Bester-van der Merwe. 2014.
  Comparison of population genetic estimates amongst wild, F1 and F2 cultured abalone (*Haliotis midae*). Animal Genetics 45: 456 459
- A. Roux, H. Lamprecht, R. Roodt-Wilding. 2014. Development of an Experimental Fertilization Protocol for the South African Abalone, *Haliotis midae* (Linnaeus 1758). Invertebrate Reproduction and Development 58: 42 48
- L. Sandenbergh, R. Roodt-Wilding, A.E. Van der Merwe, S.W.P. Cloete. 2013.
  Analysis of a South African Merino flock divergently selected for reproductive



potential. Proceedings of the Conference of the Association for the Advancement of Animal Breeding and Genetics 20: 98 – 101

- A. Bester-van der Merwe, S. Blaauw, J. du Plessis, R. Roodt-Wilding. 2013. Transcriptome-wide Single Nucleotide Polymorphisms (SNPs) for abalone (Haliotis midae): Validation and application using GoldenGate medium-throughput genotyping assays. International Journal of Molecular Science 14(9): 19341 19360
- L. Mirimin, J.C. Ruiz Guajardo, J. Vervalle, A.E. Bester-Van der Merwe, S. Kerwath, B. Macey, P. Bloomer, R. Roodt-Wilding. 2013. Isolation and validation of microsatellite markers from a depleted South African sciaenid species, the dusky kob (*Argyrosomus japonicus*), by means of the FIASCO/454 approach.
  Conservation Genetics Resources 5: 841 844
- C. Rhode, J. Vervalle, A.E. Bester-van der Merwe, R Roodt-Wilding. 2013. Detection of molecular signatures of selection at microsatellite loci in the South African abalone (*Haliotis midae*) using a population genomic approach. Marine Genomics 10: 27 36
- A. Roux, H. Lamprechts, R. Roodt-Wilding. 2013. Reproductive histology of cultured *Haliotis midae* (Linnaeus, 1758) and preliminary evaluation of maturation. Journal of Shellfish Research 32: 143 – 153
- J. Vervalle, J-A. Hepple, S. Jansen, J. Du Plessis, P. Wang, C. Rhode, R. Roodt-Wilding. 2013. Integrated linkage map of *Haliotis midae* Linnaeus based on microsatellites and SNP markers. Journal of Shellfish Research 32: 89 103