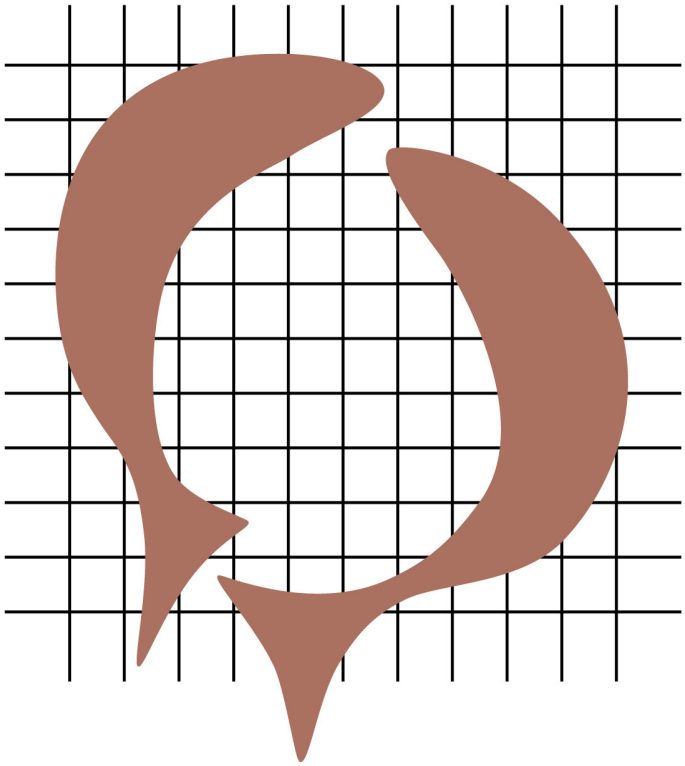
NVG NEWSLETTER

23rd year no. 1, June 2014

Nederlandse Vereniging voor

Gedragsbiologie



Contents:

NETHERLANDS SOCIETY FOR BEHAVIOURAL BIOLOGY

The Netherlands Society for Behavioural Biology aims at strengthening behavioural biology in the Netherlands and the direct surroundings. We strive for top quality in all of the behavioural sciences with respect to teaching, research, and public debate. The society organizes a yearly meeting and distributes this biannual newsletter.

Council members:

Prof. Dr. Simon Verhulst (Chair)

Dr. Ruud van den Bos (Secretary)

Dr. Jeroen Stevens (Belgium)

Dr. Kees van Oers (PhD workshop)

Dr. Liesbeth Bolhuis (Treasurer)

Dr. Martine Maan (NVG-meeting)

Dr. Hans Slabbekoorn (Newsletter)

More information available at:
http://www.gedragsbiologie.nl

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Membership fee: € 25,- per year for (PhD-)students and biologists in-between-jobs. Others: € 30,-.

Contributions newsletter:
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Editorial Preface

This newsletter is filled with memories of those who made a lasting impression as a scientist and as a person. I remember Piet Sevenster personally from the Symposium on stickleback behaviour in Leiden (1994) and from waiting for my room as starting PhD-student, as it was still used by Piet while he was slowly moving out after his retirement. I remember Piet as a remarkably calm and aimable professor, always in for a chat about any behaviour of any species. This year my interest was drawn to circadean rhythms in fish and also his work on fish sleep came back to my memory. Science changes, but trending topics go in cycles. Value of inspiring scientists always remains. **Hans Slabbekoorn**

SOESTERBERG

~ Announcement for the next NVG-meeting at the Kontact der Kontinenten.

The 22nd NVG meeting will be held from Wednesday 26th to Friday 28th of November 2014 in conference hotel 'Kontakt der Kontinenten' in Soesterberg, The Netherlands. (www.kontaktderkontinenten.nl)

Registration will open in September 2014.

The meeting starts on Wednesday evening, after the PhD workshop (see below), with the Brill Baerends Lecture*. This year, the Brill Baerends Lecture will be presented by **Prof. Dr. Theunis Piersma** (http://www.rug.nl/staff/t.piersma/).

Theunis Piersma is Professor of Global Flyway Ecology at the University of Groningen and Wadden Sea biologist at the Royal Netherlands Institute for Sea Research (NIOZ). He is also this year's winner of the highly prestigious Spinoza Prize. His research integrates evolutionary, ecological, and developmental perspectives in the study of mudflat and meadow birds, incorporating effects of climate, food, predators, pathogens and historical contingency.

Other confirmed speakers include Prof. Dr. Tom Tregenza (University of Exeter, UK) and Prof. Dr. Trine Brilde (Aarhus University, Denmark).

Tom Tregenza leads the Evolution research group at the Centre for Ecology and Conservation of the University of Exeter, Cornwall Campus. He studies how evolution shapes the biodiversity and behaviour of animals. He uses insects and other model systems to understand questions about how species form and the evolutionary consequences of sexual reproduction. (http://www.selfishgene.org/Tom/).

Trine Brilde is at the Department of Bioscience of Aarhus University. She uses social spiders as a model system to investigate the evolution of (kin) cooperation, the evolutionary ecology of inbreeding, as well as sexual selection and

evolution of mating systems. She is also interested in the ecology and phylogeography of social spiders. (http://pure.au.dk/portal/en/trine.bilde@biology.au.dk)

As usual, the annual meeting will be preceded by a workshop for starting PhD-students on Wednesday 26th of November. This workshop is organised by Kees van Oers (k.vanoers@nioo.knaw.nl) and will feature a guest speaker and several PhD students who will present work from their research projects.

The theme of this year will focus on the relevance of your PhD work. What is the societal and broad scientific value of your research and how do you spread the word. There will be ample time for discussion with fellow students and some more senior scientists. All PhD students in behavioural biology are invited to attend! Please mark the dates and spread the word…

See you at our 22nd meeting!

Martine Maan & Kees van Oers

www.gedragsbiologie.nl/ Soesterberg2014

Behavioural Biology masterclass

In addition to the PhD workshop, which is organized just before the yearly NVG meeting, there was a need to organize masterclasses aimed at PhDs in the field of Behavioural Biology. These masterclasses will not be organized by the NVG itself, but by any Dutch or Flemish group working in the field of behavioural biology. The masterclass may consist of a 1- or multiple-day meeting in which participants will be offered practical or conceptual skills.

Form:
Each year, ideally up to four, one or multiple-day meetings that are aimed at methodological issues in a range of behavioural theme's. The theme will be chosen by the organizing group, and needs to be approved by the NVG. The NVG will make an inventory among the Dutch and Flemish PhDs to see for which themes the greatest need exists. The group should primarily consist of PhDs but also early-career Postdocs and MSc students should be allowed. PhDs may earn ½ ECTS per day when taking part of such a master class.

Target group:
The masterclasses should be aimed at PhD level. Participants should be PhD students that are working in behavioural biology or a related field. The number of people participating in such a masterclass would ideally be between 6 and 10, to ensure that the masterclass will have an interactive nature.

Organisation:
The organization will be by a Dutch or Flemish research group. They will take place on-site.

Role NVG:
NVG will provide a compensation of € 250 per masterclass. NVG will also provide a certificate for each participant, which will be provided after an evaluation.

Rules:
- The masterclass will be announced at least 2 months before. Both the organizing group and the NVG will ensure a broad distribution.
- A minimal number of 6 participants, of which at least half works at a group other than the organizing group.
- The group does a short group evaluation and reports to the NVG. After this, the NVG will provide the € 250 and will send the certificates to the participants.

A masterclass will be organized by Ruud van den Bos & Gert Flik on:
Zebrafish brain and behaviour: from gene to ecology.

Venue: Huygens Building Faculty of Science Radboud University Heyendaalseweg 135, Nijmegen
When: 13/14 or 20/21 Nov 2014, check for announcements on the NVG-website or on:
http://www.ru.nl/organphy/people/ruud-van-den-bos/

Radboud University Nijmegen

IN MEMORIAM

~ Obituaries for influential investigators in behavioural biology of Dutch or Belgian nationality.

Piet Sevenster (1924-2014)

January 19th, 2014 one of the last remaining Dutch pupils of Niko Tinbergen passed away, Piet Sevenster.

Piet was an exceptionally gifted teacher. Many hundreds of students may remember how he introduced them to stickleback behaviour. Master students with a stickleback subject he took out into the polder, because "they had to see sticklebacks in their natural habitat at least once in their lives". With lucky elects he went on

discussion lunches almost weekly, some for years. These lunches made a lasting impression due to Piet's scientific shrewdness and erudition.

In 1949 he accompanied Tinbergen to Oxford as the Master's assistent. During that year Piet made the acqaintance of famous and coming biologists: Hardy, Garstang, WMS Russell, Manning, etc. Tinbergen wished Piet to stay and study Kittiwakes in the field for a PhD, but Piet preferred to return to Leiden, to learn from Jan van Iersel and his new, strictly quantitative methods. It certainly was a prerogative to be educated by these two men. Jan's iron logic and unshakeable faith in quantitative work combined with Piet's elegant experimenting and feeling for the relationship between lab and nature were a unique combination.

In 1975 Piet received an honorary readership at Leiden University, which was turned into a professorate in 1980. From 1977 he was also extraordinary professor at the Free University of Brussels to teach ethology for psychology and pedagogy students. He accepted a guest professorship at Queens College (University of New York) in 1968.

Piet's high-quality published work has had substantial impact on the behavioural sciences. An anthology: In his fine-grained analysis of displacement fanning in the three-spined stickleback, Piet discovered the principle of '*disinhibition*'. At the time this revolutionised thinking about displacement activities in general. Operant conditioning experiments with sticklebacks met with some fundamental constraints caused by the animal's natural motivational structure. These were of considerable value to learning theory.

From an early date, Piet pleaded for optimal conditions for lab animals held in stock, lest results of experiments (unnaturally impoverished by definition) would lose relevance to the natural situation. He was one of three independent discoverers of the principle of behavioural selection (Russell & Russell, 1990).

His studies in behavioural genetics include selection and crossing experiments with an aberrant '*double-creeping-through trait*' and a thorough analysis of the respective contributions of heredity and environment on the aggressive behaviour of sticklebacks, conducted in Leiden and in Brussels. Keith Nelson's discovery of the organising function of the creeping-through cycle opened up a whole new field of experiments for Piet and his pupils.

The above should not suggest that Piet was only interested in sticklebacks. Surely, he was much attached to this classic animal of ethology, but his scope was much wider. Learning experiments with horses and dogs, field work on gulls and terns and studies on skuas at far-away islands together with Ab Perdeck and Olaf Paris to mention a few. His office used to be populated with doves, chipmunks or gerbils. Later, he gave much attention to the cause of animal welfare, which he managed to approach with scientific precision as well as with his heart.

After his retirement, Piet continued with stickleback studies, turning to circadian rhythms and sleep. Those alive to-day honour him as a great scientist, a stimulating teacher and charming person.

Koenraad Kortmulder

Read more on:
www.natuurenkunstgrepen.blogspot.nl

Johannes (Hans) van den Assem
(3 januari 1930 - 11 april 2014)

When Hans van den Assem started his studies, ethology was young. The kit consisted of pen, paper, stopwatch and graph paper, supplemented with what hands could make and animated by creativity in method and theory, *plus* readiness to do slave work.

His original interest was entomology. The orientation of digger wasps was part of his MSc programme at Leiden; for his substitute military service he studied mosquitoes and malaria in then New Guinea. Only after Jan van Iersel offered him a job, he became full-time ethologist.

Jan valued Hans for his constant disposition, zeal, carefulness and lively temperament. He kind-heartedly nicknamed him "Baron", because of Hans' remarkable interest in *noblesse*. Hans did have a gift for acting uppish, to the amusement of bystanders. His vocabulary was in style; characterised persons as *joyeux* or *flamboyant* - qualifications which applied to himself too. When he said: "disgraceful!", the verdict bore an almost uncanny weight.

Hans' PhD-thesis was on ethology's pet animal, the three-spined stickleback, not on insects. It pricked, though, he found. He specialised in interactions between males, so far studied as isolated individuals. A 6 meter wooden 'polder ditch' enriched the aquarium room. Many students will remember the location and Hans' stimulating guidance. His research was new and original; his reinterpretation of 'sneaking' behaviour, well argued. *In casu,* a male stickleback, protective colours on, steals upon a neighbour's nest, where a female is preparing to spawn. As soon as she

spends her eggs, the 'sneaker' flashes through the nest fertilising the eggs, often even before the nest owner. Not homosexual behaviour, Hans proved, but effective reproduction.

He took less than 7 years for his graduation, including the ritual of nocturnal discussions of the manuscript with ever-critical van Iersel and meetings with befriended professor Baerends (Groningen). His administrative career remained small, primarily because of his love for hands-on research. He successfully presided BION for some years and was in the *Behaviour* editorial board through decades.

PhD finished, he returned to insects. He quickly created a broad programme on courtship and egg-laying of diverse parasitoid wasps. Hans did most original and inventive research, designing ingenious electronic equipment along with many an elegant little gadget. Cooperating with Eric Charnov, he was among the first to test the 'sex allocation' theory, with an influential Nature publication to his record.

During the end-of-the-century shift in university culture, when some threw in the towel in despair, Hans stuck to his principles of pure science and kept publishing his beautiful results. After retirement, he published together with Leo Beukeboom on curious hybrid wasps, observing their behaviour in his home setting. He stayed his smart self till long after retirement, until he became dependent on the help of his sisters, which did a lot for him. When he picked up the phoned, there was a cautious "Hallô?" and no longer the robust answering that we had been familiar with in the lab for so long: "VándenAssem". Dear old Hans, we will miss him.

Koenraad Kortmulder and *Yuri Robbers.*

Read more on:
www.natuurenkunstgrepen.blogspot.nl

Lex Cools: a remarkable person…

Ruud van den Bos
Radboud University Nijmegen

Lex Cools (1942-2013), my tutor during my PhD (1986-1991), passed away last year, on the 7th of September. Lex, emeritus professor Neuropharmacology at the Radboud University Nijmegen (1985-2009), played an important role in the development of neuro- and behavioural biology in the Netherlands and in the development of our Society.

Here, I like to highlight his special character as a scientist and supervisor with some personal notes. For a detailed overview of his career and scientific achievements I refer to: *Ellenbroek et al. (2014). Alexander Rudolf Cools (1942-2013), Psychopharmacology 231:2219–2222*).

I met Lex in 1984 by accident as a student at the Radboud University while looking for an

internship at the Institute of Pharmacology at the Medical Faculty. He immediately made a lasting impression by connecting psychology to the working of biologically active molecules (such as related to alleviate suffering in humans) in a way that revealed passion and unconditional dedication to science.

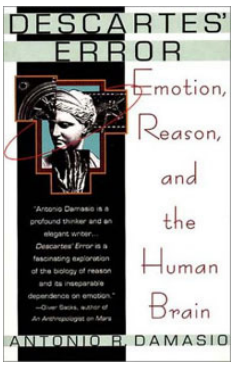
We made an appointment and he gave me a manuscript on the relationship between brain and behaviour (*Cools (1985) Brain and behavior: Hierarchy of feedback systems and control of its input. In: Klopfer P, Bateson P (eds) Perspectives in Ethology. Plenun Press, New York, pp 109–168*). I think that this manuscript more than anything expressed what kind of person Lex was: an artist and a pioneer.

There's a difference between art ('*kunst*') and craftsmanship '(*kunde*'): art creates new worlds, craftsmanship is a skill to improve ('*kunst schept, kunde werkt uit*'); or to stay in the realm of biology: art creates a cow, craftsmanship improves the creature or knows how to exploit it ('*kunst schept de koe, kunde verbetert hem of melkt hem uit*').

Where we use innovative and pioneering research as buzz words nowadays to indicate the special character of our research and proposals, people like Lex Cools truly lived up to these buzz words. Lex was more of a generalist than a specialist, which followed logically from his broad view on brain and behaviour. Lex also collaborated with people from many disciplines; interdisciplinary research *avant la lettre*. In addition, he worked with many different species, not in the least with the human species, healthy or suffering from disease, such as Parkinson's disease. For this work, he was awarded the 'Winkler medal' by the Dutch Society for Neurology; valorisation *avant la lettre*.

The power of the creativity of Lex also had a downside. He lived to the max, which led to a series of health-related problems leading eventually to his untimely death. Furthermore, he did not spare his audience. I have fought many a battle with Lex, over many different subjects and issues, but it never muddled the waters between us; rather, it increased our mutual respect. However, I think that he has made some enemies at places where you rather not have them, which I feel may have had a negative effect on his scientific career.

Last year, over summer, I was working on a review of the Iowa Gambling Task as a simple model to study the role of emotions in long-term behaviour in humans and animals as well as the role of prefrontal-striatal systems herein (*van den Bos et al. (2014) A rodent version of the Iowa Gambling Task: 7 years of progress. Front. Psychol. **5**:203).* Lex was indirectly responsible for me writing this review by pointing me towards a book by Antonio Damasio (*Descartes' Error*),



which contained highly relevant passages for the topic of this review. Sometimes a few remarks by the right person make a world of difference.

With Lex passing away a creative thinker is gone. While writing the manuscript on the Iowa Gambling Task I felt that Lex was critically reading along. I decided therefore to pay him a visit and discuss his viewpoints and reasons to refer me to the book. Alas, death paid him a visit and had already collected him. So, I suppose we should have this conversation some time later; a comforting thought…

BEHAVIOURAL BIOLOGY APPLIED

~ Special reports from the field of non-academic applications of scientific insights on animal behaviour.

Examples of how behavioural biology has added value to solve high profile problems

Diederik van Liere
CABWIM consultancy

From the start onwards, I have been a member of the society. However, the society is biased to only research done by universities or the like. The society is inwardly focussed and that seems to maintain, in spite of year in and year out struggles with poor recognition. I find that a pity for our profession. There is so much more to be gained and so much more potential. I believe that, but I realize that I may have a limited scope. To show what other means are possible I would like to explain a bit about my own career. Perhaps a few amongst you get inspired to new ways in profiling our discipline. Perhaps we can work together.

I did fundamental research for my PhD, dealing with how dustbathing in chickens is organized and what its function might be. I showed that lipid contents on the feathers is regulated by dustbathing, but the litter has to adsorb lipids across the whole feather, including the down. Therefore litter like sand is okay, but not wood-shavings or the like, as wood-shavings cannot penetrate between the feathers deep enough. Stale lipids are a causal factor for dust bathing and much repetition is performed in wood-shavings.

Another finding was that dustbathing in itself, so the movements as such, is important to the animal. That was shown as a rebound of that behaviour can be

observed after a period of several weeks with chickens only able to walk on sticks and unable to lie down. The rebound was shown when chickens were provided a wooden plate after the sticks, so still no litter was involved. That has been very interesting and educational to me. Chickens have to recognize proper litter and learn what the effects of a dustbath are. Normally they are given the example by the mother hen. Whatever learnt locally is transferred to the chicks, which can be functional.

This research on dustbathing chickens has inspired me to think that much appreciation of the environment depends on the individual's local experience and what is being transferred to the next generation. I call that a culture. Also in wildlife.

Since 2001, I work for my own company and apply what I have learnt to try to find new ways to solve problems that wildlife is causing. I did a lot of work on rooks and still do. However only now I find some time to publish about it. With rooks, I suggest that there are local specializations in nest building and that this is functional. Rooks need to build quickly, as they are under pressure of theft of nest material by colony members. The assumed opportunism in corvid species, in the sense that rooks can nest in almost any tree, sets one on a wrong track. I observed specialized rooks rather than opportunistic rooks and found this enables us to understand nest site choices and a possibility to attract rook colonies to a new nesting site. That has applied interest as rook colonies near human settlements can be considered a problem. And these problems hit the news all the time.

I also work with geese causing problems as they eat grass or cross the runway at an airport. No need to say this is a very high profile problem. I have published in the Journal of Wildlife Management about alternative ways to attract geese. White clover is 5 times more attractive than fertilized farmland grass. Locally it should be possible to attract geese and their young to fields that are not needed for agricultural production. We can do that with clover. In terms of biomass that is not a significant addition compared to the current agricultural production. But in terms of re-orientation it can be highly significant. It is waiting for an opportunity and change in thinking about geese management to test this. At the same time, two other companies and I have developed a geese deterring robot, that is being tested in large agricultural fields this year. The combination of the clover and the robot should solve much of the mentioned problem.

I also work with sheep farms in Slovenia that are having problems with attacks by wolves. I published in January last year about this in Applied Animal Behaviour Science. If a farm is chosen by a wolf, the same farm will increasingly have problems with wolves. The neighbour may not have problems at all with the local wolves. Again a local development and learning that is very interesting to solve. The main thing to do is to understand the reinforcement and change it. Nobody in this field has thought of the possibility that chasing and biting a sheep is reinforcing as such in a canid, like a wolf. There is no need for food consumption for the behaviour to be repeated. Just like the aforementioned intrinsic reinforcement of dustbathing in chickens. That view has consequences. For instance, applying an electric fence, as is generally recommended, may only enhance the problem. Electric fences are designed and normally used to keep sheep in and not to keep wolves out. So once the wolf is in, the wolf has a ball. Indeed, surplus killing seems related to the use of fences. How to negatively reinforce a wolf that is chasing a sheep? We are currently working on that. We think of applying sensors for this purpose that detect stress in a sheep that detects a wolf. That sensor can trigger deterring devices. Great to work at!

Much of my work is based on insights in behavioural biology mixed with some creativity and combination of technical state of the art. The testing and arranging it into a proper scientific test is almost the most boring part, but necessary of course. Anyway, there is so much work to be done where our discipline can step in and mean something more than normally thought of. Hopefully our society provides a platform to develop this further.

Thanks for your attention and I am looking forward to your response.

Dr. Diederik van Liere
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Cabwim CONSULTANCY IN ANIMAL BEHAVIOUR AND MANAGEMENT

FINANCIAL SUPPORT OPPORTUNITY FOR MEETINGS AND SYMPOSIA IN BEHAVIOURAL BIOLOGY

AIM: The NVG wants to support small events with financial contributions if they yield a significant spread of interest, increase the understanding, or stimulate research ideas and collaborations in Behavioural Biology in the Netherlands or Flanders.

Guidelines follow below for applying and receiving financial support from the NVG for

Behavioural Biology events (as approved by the board on the 29th of June, 2012).

Budget & Decision Process:

1) A total of maximally €750 is available per budget year (Adjustments can only be determined at the annual meeting);
2) The possibility of support is advertised at the annual meeting and in the newsletter;
3) A board majority is required to award a support request;
4) Board members involved in a request are excluded from the decision making process;
5) Support decisions are communicated through a letter from the treasurer.

Eligibility & Applications:

1) Only NVG-members can apply;
2) Support requests need to be submitted at least six weeks before the event;
3) The application involves a brief explanation of how the event matches our aim;
4) The application should include a budget with costs, benefits and other co-sponsors.

Obligations & Reimbursement:

1) The applicant is obliged to inform NVG-members at least two weeks in advance about the NVG-supported event;
2) The applicant is obliged to write a brief report for the next newsletter about the event;
3) Payment takes place after the event, based on actual receipts, and after having received a newsletter report;
4) All documents will be provided to the audit committee for the annual financial report.

THESIS DEFENSE

~ Recently defended PhD-theses on animal behaviour. Target is to provide some background and to highlight an interesting finding in a single figure.

WAGENINGEN UR
For quality of life

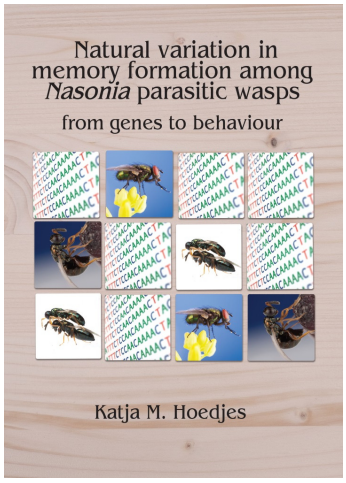
Katja Hoedjes defended her thesis '*Natural variation in memory formation among Nasonia parasitic wasps: from genes to behaviour'* on the 3rd of June 2014. The PhD-study was conducted at the Laboratory of Entomology of Wageningen University.

http://www.wageningenur.nl/nl/Publicatie-details.htm?publicationId=publication-way-343534313438

By: Katja Hoedjes (katjahoedjes@gmail.com)

The ability to learn and form memories is widespread among the Animal Kingdom and the underlying processes are evolutionary conserved. Yet, intriguing natural variation in memory formation is observed among animal species.

This variation is thought to reflect differences in ecological constraints among animal species. The genetic basis underlying variation in memory formation is largely unknown, however.



Parasitic wasps are ideal model species to study variation memory formation, as there are substantial differences among closely related species. Most studies on learning in parasitic wasps have focused on ecological factors involved in variation in memory formation. In my project, I have studied parasitic wasps of the genus *Nasonia*. These small wasps (~1-2 mm in length) lay their eggs in pupae of various fly species and can learn odours that guide them toward these hosts. At the start of my project, I developed a high-throughput conditioning procedure in which female wasps learn that an odour is associated with the reward of a host pupa. Memory retention is tested with a T-maze olfactometer: a two-armed olfactometer in which wasps walk toward one of the two offered odours (i.e. the learned odour vs. a second odour). Using this assay, I characterized long-term memory formation of two *Nasonia* species. *Nasonia vitripennis* forms long-term memory after a single conditioning trial, which lasts more than 6 days. The closely related species *N. girault*i, on the other hand, has lost its memory after 2 days and only forms long-term memory after multiple conditioning trials.

My project has focused mostly on identifying genetic mechanisms that are responsible for the difference in long-term memory between the two *Nasonia* species. I have used two experimental approaches to investigate this question. The first approach took advantage of the unique opportunity to interbreed *Nasonia* species. I

Figures: A *Nasonia vitripennis* female parasitizing a *Calliphora vomitoria* pupa (left) and the high-throughput conditioning set-up (right). Photo's by Hans M. Smid.

mated *N. vitripennis* females with *N. girault*i males to generate hybrid offspring. Then, I backcrossed this hybrid offspring to *N. vitripennis* males for several generations to create so-called introgression lines that had the memory phenotype of *N. girault*i in the genetic background of *N. vitripennis*. By analyzing the genomes of the introgression lines, I identified two genomic regions that reduce long-term memory in the introgression lines. One or multiple genes located within these regions are likely responsible for this observed reduced memory. Next to the introgression approach, I measured gene expression patterns in the brains of the two species after conditioning. This revealed substantial differences in gene expression between the two species, which may indicate memory-activating or –inhibiting mechanisms, respectively.

My research has provided valuable and novel insights in the genetic regulation of differences in long-term memory formation. The results presented provide the basis for the identification of genomic factors that determine if long-term memory is formed or not. In addition, it was characterized how these factors affect gene expression patterns in the brains of the *Nasonia* species. The processes underlying memory formation are highly conserved, and the results from my research may, therefore, be applicable to other animal species and humans as well. Consequently, this work on *Nasonia* memory formation brings us closer to understanding the genetics and evolution of variation in memory formation.

References

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Hoedjes K.M., Steidle J.L.M., Werren J.H., Vet L.E.M., Smid H.M. (2012) High-throughput olfactory conditioning and memory retention test show variation in *Nasonia* parasitic wasps. Genes, Brain and Behavior 11: 879-887.

Hoedjes K.M., Kruidhof H.M., Huigens M.E., Dicke M., Vet L.E.M., Smid H.M. (2011) Natural variation in learning rate and memory dynamics in parasitoid wasps: opportunities for converging ecology and neuroscience. Proceedings of Royal Society B – Biological Sciences 278: 889-897.

Katja Hoedjes will join the group of Prof. Dr. Laurent Keller at the University of Lausanne, Switserland, to study the effects of developmental nutrition on adult behaviour of fruit flies.

Conferences & Meetings

- **ECBB–2014**, 7th European Conference on Behavioural Biology, 17-20 July, Prague, Czech Republic: http://ecbb2014.agrobiology.eu/

- **EED–2014**, 5th Congress of the European Society of Evolutionary Developmental Biology, 22-25 July, Vienna, Austria: http://evodevo.eu/conferences/2014

- **ISAE–2014**, 48th Congress of the International Society for Applied Ethology, 28 July - 1 August, Vitoria-Gasteiz, Spain: http://www.applied-ethology.org/isaemeetings

- **ABS-2014**, 51th Annual Conference of the Animal Behavior Society, 9-14 August, Princeton University, NJ, USA: http://animalbehaviorsociety.org/absmeetings/51st-annual-meeting-of-the-animal-behavior-society

- **ISBE–2014**, 15th International Behavioral Ecology Congress, 12-17 August, Hunter, City University of New York, USA: http://cabi.hunter.cuny.edu/isbe2014c

- **IOC-2014**, 26th International Ornithological Congress 18-24 August, Tokyo, Japan: http://ioc26.jp/

- **Measuring Behavior 2014,** Annual International Conference on Methods and Techniques in Behavioral Research, 27-29 August, Wageningen, the Netherlands: http://www.measuringbehavior.org/mb2014/home

- **NVG–2014**, Annual Meeting of the Netherlands Society for Behavioural Biology, 26-28 November, Soesterberg, the Netherlands: www.gedragsbiologie.nl

- **NAEM–2015,** Netherlands Annual Ecology Meeting of the Netherlands Ecological Research Network (NERN) and the Dutch - Flemish Ecological Society (NecoV), 10-11 February, Lunteren, the Netherlands: http://www.nern.nl/ NAEM-2015

- **EHBEA–2015,** Annual meeting of the European Human Behaviour and Evolution Association, 29 March-1 April, University of Helsinki, Finland: http://ehbea.com/

- **BGA–2015,** 45th Annual meeting of the Behavior Genetics Association, 18-21 June, San Diego, CA, USA: http://bga.org/meetings/

- **Evolution-2015,** joint annual meeting, 19-23 June, Sao Paulo Brazil: http://evolutionsociety.org/

- **Behaviour 2015,** Joint meeting of the International Ethological Conference (IEC), the Australasian Society for the Study of Animal Behaviour (ASSAB), and the Australasian Evolution Society (AES), 9-14 August, Cairns, Australia: http://www.behaviour2015.org/