

## A LIFE OF SPIDERS: CHRISTA DEELEMEN AND HER COLLECTION

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#### *About this text*

*Karen van Dorp worked as a collection manager in Naturalis Biodiversity Center (Leiden, The Netherlands) from 2009 until 2019. Amongst the collections she curated was the collection of Christa Laetitia Deeleman-Reinhold. Karen became fascinated with Christa's intriguing past, her long relationship with the Leiden museum, and her very important contributions to the institute's Southeast Asian collections. Out of admiration and respect grew the urge to record Christa's story. This biographical text is based on an interview held with Christa in her house in February 2019 and is therefore an associative story, instead of a strictly chronological summary of events. It is published in the year Christa turns 90 years old – and she is as active in her spider research as ever.*

*Karen is very grateful to Christa, who opened her house, her collection and her mind in order to let Karen write this short biography which hardly does her long, interesting and passionate life justice. She also likes to sincerely thank Peter van Helsdingen (former deputy-director of the 'Rijksmuseum van Natuurlijke Historie'; now Naturalis Biodiversity Center, active spider scientist and a friend of Christa's) for reviewing and publishing this text. Phoebe Larkin kindly helped with translating the original Dutch text in English.*

Twice in her life, Christa has been seriously ill, to the point that she almost lost her life. The first time it was scrub typhus in Indonesia, and at a very late age she was diagnosed with Lyme's disease, which nearly killed her and took her a long time to recover from. Both diseases are caused by arachnids – in the case of scrub typhus, a bacterial infection is transferred by a mite and in the case of Lyme's disease, by a tick. The fact that she has had two almost fatal diseases caused by arachnids seems a cruel joke: Christa dedicated her entire life to the study and collection of spiders.

People like Christa Deeleman-Reinhold are fascinating. Their passions and drives are difficult to fathom. When they are asked about the reason behind their intensive life-long studies of a particular group of organisms, the answer is usually the same: it just happened coincidentally. For Christa, born on 23 November 1930, it did not happen in any other way. She also did not know from an early age that spiders would play such a big role in her life, even though an interest in nature and the living world around her had been there from when she was very young - she has seen old footage of herself as a toddler in the Dutch Indies, carrying rabbits around and canvassing the forest floor. Later, when she was a young girl living in The Hague in The Netherlands, there had been a maid in their house who was terrified of spiders, and Christa automatically adopted that fear. She found Garden Spiders particularly creepy: when she walked along the garden path, the threads of their freshly woven webs would stick to her clothes. During her teenage years, when she became an active member of the Nederlandse Jeugdbond voor Natuur ('Dutch Youth Association for Nature'), spiders still had not caught her attention. She was mostly interested in birds and plants at the time. During the Second World War, no camps were organised, but Christa spend all of her free time with the NJN. Her love for nature grew and after graduating from school at the Vrijzinnig-Christelijk Lyceum in Scheveningen, she wanted to study biology at Leiden University. Her mother, who would have loved to **continue** her studies after graduation but had become a secretary, agreed with Christa's plan, but wanted her to see more of the world first. Christa was sent out as an au pair to France and The United Kingdom, where she learned to speak French and English perfectly. She returned to The Netherlands after a year, and started at Leiden University in 1949.

Three years into her studies, Christa ended up in the Rijksmuseum van Natuurlijke Historie ('National Museum of Natural History'). She studied praying mantises from New Guinea under Hilbrand Boschma; Professor of Zoology and director of the museum. By this time, she was married to Paul Robert Deeleman and had children, but wanted to continue her studies. For her postgraduate research she studied Groud Spiders (Gnaphosidae) from Meijndel, The Netherlands at home during the late evening hours – the first time Christa worked on spiders.

Robert didn't stop her; he never had, and he never would. He shared her urge to discover the world. As a businessman, Robert financed and encouraged Christa to visit remote places. He felt that travelling was to explore, and this accounted for many journeys to extraordinary destinations. During a camping trip in Yugoslavia Christa and Robert ran out of drinking water, and young shepherds took them into a cave. While filling their water bottles with fresh water, small, almost transparent shrimp and isopods caught their eye. They were immediately fascinated: caves hold very special life forms, and because of the remote places they live, these are mostly unknown to science. Christa decided to specialize in cave spiders at the museum. Under the supervision of Koos Wiebes, assistant-director of the museum, she worked on the taxonomy of the spider genus *Troglohyphantes*, for which she and Robert collected material together from Yugoslavian caves. Any expenses

made for her research were tax-deductable, and Christa and Robert thus spent much time camping on the remote limestone massives in Yugoslavia. In the hollows, grikes and hallways, they collected spider species that had never been described before, which had adjusted in the most striking ways to their nutrient-poor environment. Even though her interest in spiders grew rapidly, Christa was still left with some of that old fear: when it was necessary to collect a large specimen, she would call Robert for help.

After many travels to Yugoslavia, the political instability at the end of the seventies brought a halt to the fieldtrips there. Christa obtained her PhD in 1978<sup>3</sup> and curious as to what she would find in the tropical rainforests of Indonesia, she decided to join Robert on one of his business trips to Indonesia in 1979. They would extend their stay with a field trip to collect spiders in National Park Kinabalu in the Malaysian state of Sabah on the island of Borneo. After a few days of successful collecting in the mountains, they stayed in a *dessa* (a rural village), where Christa fell seriously ill. Regardless of her symptoms, she refused to give up collecting and joined Robert on a fieldtrip to Java, but back on Borneo she grew weaker and weaker. After examination by a physician from the local hospital it was clear that it was not malaria, but no definite cause was determined. She was treated with different types of medication in hope for her recovery and after some time, she started to feel better. Later, when she was back at the museum and told her story to the mite specialist Dr. Leendert van der Hammen, she learned that she had been the victim of scrub typhus; a bacterial infection that is transferred by mites.

In 1980, Robert was claimed unfit for employment, which left the couple with plenty of time to travel. Her first severe tropical disease did not stop Christa from visiting the tropics over and over again. She loved exploring the relatively badly mapped rainforests, where there was so much to be discovered and she travelled all over South East Asia: Sumatra, Kalimantan, Sulawesi, Java, Thailand, Malaysia. In the collection of the Rijksmuseum van Natuurlijke Historie, where she spent most of her time between trips, she found very little useful comparative material to the specimens she collected. Dr. Van der Hammen had brought arachnid specimens back to the museum after the 1959 Sterrenberg expedition to New Guinea, but this material consisted mostly of mite specimens. Apart from some impressive spiders from the genus *Nephila*, there was just a small collection of arachnids in the museum and most of the material that Christa brought back to The Netherlands was new to science.

Collecting was done mostly by hand – Christa and Robert used nets, turned leaves and sieved through soil samples. This was very time-consuming work. In Bohorok, a rehabilitation centre for orang-utans in National Park Gunung Leuser (North Sumatra), they met Suharto Djojosedharmo. Suharto worked as a foreman at the centre and he invited the couple to stay at his house. A close friendship grew between them. Robert taught Suharto how to collect spiders and gave him nets, jars, ethanol and a small financial compensation, to ensure collecting would continue even when Robert and Christa were not in Indonesia. Suharto turned out to be an excellent and enthusiastic collector. His hard work was rewarded by Robert, who sent Suharto on fieldtrips to Bali, West Java, Central Sumatra, Central Kalimantan, Lombok and Sumbawa. The collected material was given to Christa through primologists from Utrecht, who worked at Bohorok. This way, Christa's spider collection grew steadily, during a period in which there were no regulations from local authorities for collecting small arthropods.

Robert mostly collected specimens, organised and financed trips, while Christa focused more on processing and researching new material. Eventually, their collection became too comprehensive to keep up with. Before – with the Yugoslavian cave spiders – Christa had just been able to manage, but the material collected in South East Asia contained so many new species that describing them became a huge and time-consuming task. At home, she started a card system, noted down all features and data about the material on cards and began to think about writing a book. By this time, Christa's private collection consisted of scientifically very valuable specimens, which had formed the basis for numerous publications on new genera and species. Robert tried to sell the collection to the Rijksmuseum van Natuurlijke Historie and sent inventory lists to Koos Wiebes, who let him know the museum did not agree with the given terms. The museum sent out a counterproposition, but Robert did not agree and successfully managed to sell part of the collection to the natural history museums of Geneva (Switzerland) and Stuttgart (Germany). Some years later, when Erik van Nieukerken became curator of Arachnids at the museum in Leiden, he visited Christa at her house to inspect the collection. Terms were signed at the notary's office and Christa's remaining spider collection was now in the care of the museum, on the condition that she was allowed to continue her work on the material from her home. Now associated with the Leiden museum as a guest researcher, Christa often visited the scientific library of the museum. One day, a bag

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<sup>3</sup> Revision of the cave-dwelling and related spiders of the genus *Troglohyphantes* Joseph (Linyphiidae) with special reference to the Yugoslav species. Deeleman-Reinhold, C.L. (1978)

full of important works by Tamerlan Thorell (an arachnid specialist who described a thousand new species of spider during the second half of the eighteenth century) was stolen from her car in The Hague. Christa searched through trash bins and in ditches; one book was recovered from a hospital garden and returned to Christa by the police.

After Robert had passed away, Christa decided to start writing her book. It took her ten years to complete her *opus magnum* – an extensive reference work about the spiders of South East Asia<sup>4</sup>. She continued to travel. During the first and only trip on her own, to Thailand, she realized she did not enjoy solo journeys. Nonetheless, she made her greatest discovery during this trip: a juvenile specimen of a new species of ant spider, unknown to science until she examined it. The animal had sturdy front legs with thick bristles and when it felt threatened, it would extend these legs forward which made the spider instantly resemble an ant! Christa took this juvenile home to rear it into an adult, which she could use to describe the new species, and the corresponding new genus. After some time, the box in which she kept the spider had not been closed properly, and she discovered that the animal had escaped, without having had the chance to describe it. Three days later, while studying material through the microscope, the spider suddenly walked across her desk. After catching it, Christa described the new species and named it *Pranburia mahannopi*; after the Thai park ranger who helped her to collect the specimen.

It took seventeen years before a new partner came into Christa's life. Meanwhile, she had a friend who accompanied her on her travels; who she met at the dog club and they had a mutual aunt who married into the family. Christa had found out that going on collecting trips by herself was not something she enjoyed, and when she asked him to join her on a journey to Australia, he immediately said yes. They left in June 1992 and only came back in September. After attending a conference in Australia, they took a plane to Bali and travelled on to Sumba, then Ambon and then to the Banda Islands, where Christa's ancestors were from and where her mother had been born. Her great-grandfather had been a *perkenier* ('plantation owner') and brought together a fortune by being in the well-known nutmeg trade on the Islands, and her grandmother who inherited this money married a businessman from Dordrecht. After the nutmeg trade collapsed, the money that was left disappeared and Christa's grandparents left Banda with her mother, who was a baby at the time, in 1900. They moved to The Netherlands, but her great-grandfather stayed on Banda until his death in 1926.

Christa's mother got engaged to a man who dreamt of moving to the Dutch Indies. He left for Jakarta without her, managed to arrange employment, married Christa's mother by proxy and arranged for her passage. Christa was her parent's only child and was born on Java. Her father fell seriously ill, which caused them to move back to The Netherlands in 1935, during the crisis years. Times were tough for Christa's parents - her father wasn't able to find a job, but Christa has fond memories of this period in her life. In Indonesia she had lived in luxury, in a big house with servants, but in The Netherlands she had her family! She did not care about their state of poverty and enjoyed the visits to grandmother, aunts, uncles, and cousins. Later on in life, she discovered that she had family on the Banda Islands too: when she arrived in 1992, Van der Broeke (the only Dutchman that lived on the Banda Islands by then) told her to her surprise that she had many direct family members there, from a different branch, born after the early death of her great-grandmother.

After the long trip to Australia and Banda, the expeditions continued. Christa collected all the material on her own; her travel companion did not care much for spiders and therefore did not join her during fieldwork. He was an architect and wanted to visit the locations in which his dad had been stationed during his army service years in the Dutch Indies. Some of these locations were on remote islands, which were perfect places for Christa to collect spiders. They would rent a car with a driver, dropped Christa in the places where she wanted to go and the driver would pick her up after a few hours of exploring.

As if working on the vast amounts of collected material wasn't enough; a new challenge presented itself in Christa's life. During a visit to an aunt in the United Kingdom, she decided to contact the arachnologist Anthony Russell-Smith, who lived in the neighbourhood. He was working on canopy spiders, which were collected by *canopy fogging*; a collecting technique whereby funnel-shaped sheets are stretched under a tree and the canopy is sprayed with a pesticide, after which spiders and other invertebrates fall down and are collected. Anthony was in contact with Nigel Stork, an American who sent him canopy spiders from Borneo. He conducted his research in the attic of a typical English cottage, which could be reached by climbing a rickety spiral staircase. Christa paid a visit to Anthony in this attic, looked at the canopy spiders and was blown away by what she saw. They were entirely different to any of the species she had seen herself in Borneo! She wasn't able to forget the canopy spiders and in 1992 she arranged a meeting with Andreas Floren, a German ecologist who was participating in a

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<sup>4</sup> Deeleman-Reinhold, C.L. (2001). *Forest Spiders of South East Asia: With a Revision of the Sac and Ground Spiders (Araneae: Clubionidae, Corinnidae, Liocranidae, Gnaphosidae, Prodidomidae, and Trochanterriidae)*. Brill. 592p+180illus.

large research project on the arthropod species composition in forest canopies in North Borneo. Christa and Andreas met halfway between her house and his institute in Germany, at the train station in Venlo. They agreed on Andreas sending her the sorted canopy spiders and Christa would check the number of species and how many of them were new to science – a close to impossible task, considering the lack of literature on South East Asian canopy spiders. The only publications she could consult were a few nineteenth century species descriptions in Latin by Thorell. Christa, 62 years old by now, accepted the challenge and travelled to London, Genua and Paris to examine the type specimens described by Thorell. On occasion she would find a known species, but it was the exception that proved the rule: nearly all material that Andreas sent her was unknown to science. Christa thought it was fascinating how the species composition in the canopies of the rainforests of Borneo turned out to be completely different from the species composition on the lower layers of the forests, where she had collected specimens for so many years.

Decades ago, in 1947, Christa had joined one of the NJN camps and had met Flip Stoutjesdijk. After all those years they started seeing each other again and Flip moved in with her - they would stay together for ten years, until he passed away in 2015. He was an enthusiastic birdwatcher, who did not want to have anything to do with computers: Christa dragged him to a computer course, but it did not help one bit. Flip published papers on microclimates and Christa helped him with the texts. This was very time-consuming and her work on spiders was slowly pushed to the background. During trips spiders would get less attention too – in Ukraine, Siberia and Belarus they did much more birdwatching. After Flip passed away, Christa started working on the sorting of the canopy spiders again.

Her hard work led to an enormous amount of sorted material, which slowly filled the many shelves in the cabinets of her home office, and other parts of the house. Some new species were described, but the majority of her time was spent on filling the sorting jars with species of which even their families are hardly known and might not ever be seen again – the rainforests in which they were collected do not exist anymore; felling for palm oil plantations, erosion and fires caused their complete disappearance. In 2016, Christa – together with Jeremy Miller and Andreas Floren – published about the discovery of a remarkable new spider species from the Borneo rainforest canopy that she found within the material: *Depreissia decipiens*, an enigmatic, ant-imitating jumping spider, with only one known closely related species from Africa.

Apart from working on her own collected material and the canopy material sent to her by Andreas, Christa was asked to participate in a project called ‘The Goblin Spider Planetary Biodiversity Inventory’, in which researchers from all over the world aim to unravel the systematics of the spider family Oonopidae. She had worked and published on oonopids before – tiny, unsightly spiders in her opinion, but funding was available for this major research project, and she accepted. Soon after, it became clear to her that her home office was unsuitable for the work that needed to be done. To properly examine and describe the minuscule oonopids she would have needed specialized laboratory equipment, which led to her decision to stop. She kept focusing on the sorting of the canopy material, which had intrigued her from the first time she looked at it. Going through the hundreds of tubes filled with spiders that Andreas Floren had sent her over the years became one of the most extensive challenges of her life and she spent years and years sorting the material, which she sent to specialists from around the world, who described dozens of new spider species.

Christa is almost ninety years old, but can't think of a reason to stop working on spiders. She continues to work steadily on the collection in her home office on the top floor of her house in Ossendrecht (Brabant, The Netherlands). Robert and she had the house designed and built in the sixties by a young architect and Christa still lives there. It is an impressive home, with many open spaces, large windows, inherited furniture from Indonesia and forest views. Her home office is a true Mecca for arachnologists: dozens, if not hundreds of glass apothecary jars filled with tubes that contain still to be described spider species, card-cabinets with drawings of spider genitalia, reference works, notes, offprints, microscopes and a home-made camera set-up. Apart from a little help with household chores, she does everything herself. She hosts scientists from The Netherlands and all over the world on a regular basis, shows them her collection and discusses her findings with them. She makes soup and takes them on walks around the fens in the forest behind her house, through the nature reserve where an old stone factory once stood. Her garden holds several wildlife camera traps, which send footage of foxes, deer, owls and martens to her laptop. Through e-mail she stays in contact with many international fellow experts, and her granddaughter's boyfriend helps her to overcome technical challenges that come with submitting publications.

Sometimes, in rare moments when Christa can't think of something else to do, she starts looking for spider pictures on the internet. She doesn't have to leave the house anymore when she needs to read up on literature: everything is available online these days. She was thrilled to find herself on Wikipedia, but noted that the information was not completely accurate; the list of publications from her hand was long, but incomplete.

Writing papers is something she still does. The manuscript about jumping spiders from the canopies of South East Asia is in the making, and she wants to finish it before the end of the year. A complicated and huge task – but Christa Deeleman would not be Christa Deeleman if she did not just go for it.

