





## Frans Janssens (1952–2024): A legacy in Collembola Research

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
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The scientific community mourns the passing of Frans Janssens (Fig. 1A) on 26 November 2024. A devoted Collembola researcher for over five decades, Janssens left an indelible mark on the field of soil biodiversity. Here, we celebrate his life and scientific legacy, which significantly advanced our understanding of springtails and inspired generations of researchers.

Frans Janssens was born on 18 January 1952 in Antwerp, Belgium. His interest in Collembola began at age of 18 through his involvement with the *Koninklijke Antwerpse Vereniging voor Entomologie*, a Belgian entomological society dedicated to the study and promotion of insect science. This early engagement marked the beginning of a lifelong scientific journey devoted to the biodiversity of Belgian Collembola.

In the early 1990s, his first publications appeared mainly in *Entomo-Info*, the newsletter of the Belgian Entomological Society, and included species records and ecological notes on Collembola from Belgium such as *Isotoma viridis* Bourlet, 1839 on snow, and *Sminthurides malmgreni* (Tullberg, 1877) in wetlands (Christiansen *et al.* 2009; Janssens 1992). These contributions laid the foundation for his future work in morphology, taxonomy and systematics of springtails.

Despite his modest lifestyle, Frans Janssens remained deeply involved in the international research community. He participated in conferences (Fig. 1B) and embraced collaborations across institutions and continents, reflecting his commitment to fostering knowledge and building connections within the global soil biodiversity community. Between 2001 and 2010, he made substantial contributions to the Collembola taxonomy, describing several new species, such as *Oncopodura dethieri* Janssens & De Bruyn, 2010, *Paraxenylla cubana* Palacios-Vargas & Janssens, 2006, and *Paraxenylla peruensis* Palacios-Vargas & Janssens, 2006. His collaboration with Dr. Kenneth A. Christiansen in 2011 on higher-level classification was especially noteworthy. His dedication to regional taxonomy also led to the launch of *Nomina Collembola Belgica*, a project aimed at refining the taxonomy of Belgian Collembola (Janssens 1996).

From 2010 onward, his work expanded into biogeography and species inventories, including studies from Malta and Taiwan, and he incorporated DNA barcoding into these efforts. He also explored theoretical morphology,

notably through his long-term study of the Collembola empodial complex (“feet”). Between 2020 and 2024, Janssens pursued interdisciplinary research combining taxonomy, optics, functional morphology, and ecology. Highlights included studies on humidity-dependent coloration and contributions to large-scale macroecological syntheses of global Collembola data.

Perhaps his most significant achievement was the creation and meticulous curation of *Collembola.org*, the “Checklist of the Collembola of the World” (Fig. 1C), launched in 1995. Initially hosted by Dr. Gordon J.L. Ramel and later expanded through collaborations with Dr. Kenneth Christiansen, Dr. Peter Bellinger, and other experts, the checklist grew from 1,371 to 9,186 species by October 2024. This database catalogues global species, offering information on distribution, synonymies, and nomenclatural issues. In his *Overview of Authority References*, Janssens resolved inconsistencies in author citations, ensuring accuracy and coherence. The site includes bibliographies of Collembola families and subfamilies, illustrations, photographs, and videos of various species. It remains the most diverse scientific image resource on Collembola, featuring photos submitted by enthusiasts, often annotated or identified by Janssens himself, as well as figures, and microphotographs from scientific literature. The platform also functions as a portal to contact details of active researchers and contains information on morphology, ecology, paleontology, evolution, systematics, methods, art and human–Collembola interactions. Much of this content was curated by Janssens through years of careful, dedicated work.

As Frans Janssens once said, “*The purpose of the checklist is to resolve synonym-related problems.*” Yet, the site evolved far beyond that, becoming a comprehensive repository of springtail knowledge, even including artistic renderings of these microarthropods. Exceptionally knowledgeable in zoological nomenclature, he often proposed corrections to species names according to the International Code of Zoological Nomenclature, or suggested new synonyms, sparking constructive discussions in the community.



**FIGURE 1.** A, Frans Janssens (1952–2024), pioneer in Collembola taxonomy and long-time curator of “*Checklist of the Collembola of the World*” ([www.collembola.org](http://www.collembola.org)); B, Janssens (far right) with colleagues on Texel Island, the Netherlands, August 2006, during the VII International Seminar on Apterygota. From right to left: Frans Janssens, Dr. David Russell, Dr. José Guadalupe Palacios-Vargas, Dr. Mikhail Potapov, Dr. Luis Mendes, Dr. Nikola Szucsich, Dr. Thomas Tully, *name unknown*; C, Homepage of the “*Checklist of the Collembola of the World*”.

He openly welcomed feedback and maintained a collaborative, humble spirit, creating an inclusive environment where researchers, students, and citizen scientists felt equally valued. The site has since been archived by the Wayback Machine (<https://web.archive.org/web/20250220015230/https://collembola.org/>) and will be migrated to a stable taxonomic platform to ensure long-term accessibility.

Frans Janssens was also a passionate advocate of citizen science, mentoring amateur naturalists in microscopy, fieldwork, taxonomy, and digital imaging. He was an early adopter of digital imaging for species identification and invested heavily in geotagging springtail records worldwide. His outreach bridged the professional–amateur divide, transforming curiosity into meaningful contribution. Through digital correspondence and open-access resources, he cultivated a global network of Collembola enthusiasts, many of whom now actively contribute to research and education.

His mentorship and collaboration strengthened taxonomic capacity in multiple countries. This obituary will be translated into Chinese and other languages to inspire future research in soil biodiversity. His mentorship had a global reach. One co-author, Hsin-Ju Cheng, recalls their exchanges via Flickr, where he annotated her images and offered detailed morphological feedback. Reflecting his international influence and lasting scientific legacy, two springtail species were named in his honor: *Stenognathriopes (Tenentiella) janssensi* Zeppelini & Silva, 2012 (from Brazil), and *Americanura janssensi* Palacios-Vargas, Simón Benito & Paniagua Nacamendi (from Mexico).

Beyond his scientific endeavors, Frans was remembered by family and friends as a gentle, agreeable, and attentive individual. Known for his kindness and capacity for deep listening, he was widely respected. He found joy in life's simple pleasures, particularly spending time in his garden and taking quiet walks in nature. Averse to long travels, he preferred the peace and familiarity of home. Reflecting on his life, Frans once said, "*I always got to do everything I wanted to do, and that is a privilege.*" These words capture his sense of fulfillment and gratitude. His lifelong engagement with Collembola was not only a scientific endeavor but also a personal calling that shaped his vocation and worldview.

As this obituary shows, Frans was a passionate naturalist. Although professionally employed in the engineering sector of a telecommunications company, he voluntarily dedicated a substantial part of his life to studying Collembola. In his later years, he lived a modest yet deeply fulfilling life with his wife, Marina Calluy, dividing his time between tending their wild garden and carefully maintaining *Collembola.org*. His humility, generosity, and profound respect for nature exemplify a life lived richly through passion, curiosity, and kindness.

This article is dedicated to Frans Janssens' memory. We extend our deepest sympathies to his family, especially to his wife, Marina Calluy, who expresses sincere gratitude to all colleagues who contributed to this tribute. We thank her and Dr. Juliane Filser for providing photographs to this obituary. We are grateful to Dr. Louis Deharveng, Dr. Ernest C. Bernard, Marie Louise Huskens, Ryne Pavy, and Roel F. H. M. van Bezouw for their valuable insights and suggestions. We also thank Dr. Cristina Fiera and an anonymous referee for their valuable corrections and comments that helped improve this article.

## References

- Christiansen, K.A., Bellinger, P.F. & Janssens, F. (2009) Collembola: (Springtails, Snow Fleas). In: Resh, V.H. & Cardé, R.T. (Eds.), *Encyclopedia of Insects*. 2<sup>nd</sup> Edition. Academic Press, San Diego, pp. 206–210.  
<https://doi.org/10.1016/B978-0-12-374144-8.00064-3>
- Janssens, F. (1992) *Sminthurides malmgreni* (Tullberg, 1876) op poelen in Hove (Collembola). *Entomo-Info*, 3 (4), 99–100.
- Janssens, F. (1996) *Nomina Collembola Belgica*. *Entomo-Info*, 7 (3), 79–90. [provisional printed edition]
- Janssens, F. & Christiansen, K.A. (2011) Class Collembola Lubbock, 1870. In: Zhang, Z.-Q. (Ed.), *Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness*. *Zootaxa*, 3148 (1), pp. 192–194.  
<https://doi.org/10.11646/zootaxa.3148.1.34>



## Appendix

### Bibliography of Frans Janssens

- Ashwood, F. & Janssens, F. (2024) New Zealand's giant springtails (Collembola: *Holacanthella*): now available in purple. *The Wētā*, 58, 34–39.
- Baquero, E., Janssens, F., Les, J. & Jordana, R. (2006) New species of *Pseudosinella* (Collembola: Entomobryidae) from a cave of Bizkaia (Basque Country), Spain. *Boletín de la Sociedad Española de Espeleología y Ciencias del Karst*, 6, 72–76.
- Cheng, H.J., Bellini, B.C., Janssens, F., Nakamori, T. & Chang, C.H. (2024) The cryptic diversity of the terrestrial microarthropods, *Ptenothrix* Börner (Collembola: Dicyrtomidae) from Taiwan: new species plus the lectotype designation for *Ptenothrix denticulata* (Folsom, 1899). *Zoological Studies*, 63, e2024.  
<https://doi.org/10.6620/ZS.2024.63-42>
- Cheng, H.J., Janssens, F. & Chang, C.H. (2022) An updated checklist of Collembola in Taiwan, with DNA barcoding of *Papirioides jacobsoni* Folsom, 1924 (Symphyleona, Dicyrtomidae). *ZooKeys*, 1123, 123–146.  
<https://doi.org/10.3897/zookeys.1123.90202>
- Christiansen, K.A., Bellinger, P.F. & Janssens, F. (2009) Collembola: (Springtails, Snow Fleas). In: Resh, V.H. & Cardé, R.T. (Eds.), *Encyclopedia of Insects. 2<sup>nd</sup> Edition*. Academic Press, San Diego, pp. 206–210.  
<https://doi.org/10.1016/B978-0-12-374144-8.00064-3>
- Dekoninck, W., Lock, K. & Janssens, F. (2007) Acceptance of two native myrmecophilous species, *Platyarthrus hoffmannseggii* (Isopoda: Oniscidea) and *Cyphoderus albinus* (Collembola: Cyphoderidae) by the introduced invasive garden ant *Lasius neglectus* (Hymenoptera: Formicidae) in Belgium. *European Journal of Entomology*, 104 (1), 159–161.  
<https://doi.org/10.14411/eje.2007.023>
- Dukes, C.D., Janssens, F., Recuero, E. & Caterino, M.S. (2022) Specific and intraspecific diversity of Symphyleona and Neelipleona (Hexapoda: Collembola) in southern high Appalachia (USA). *Diversity*, 14 (10), 847.  
<https://doi.org/10.3390/d14100847>
- Janssens, F. & Christiansen, K.A. (2011) Class Collembola Lubbock, 1870. In: Zhang, Z.-Q. (Ed.), *Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness*. *Zootaxa*, 3148 (1), pp. 192–194.  
<https://doi.org/10.11646/zootaxa.3148.1.34>
- Janssens, F. & De Bruyn, L. (2010) A new cave species of the genus *Oncopodura* Carl & Lebedinsky, 1905 from Belgium (Collembola: Oncopoduridae). *Entomo-Info*, 21 (3), 49–56.
- Lock, K., Janssens, F. & Janssen, C. (2003) Effects of metal contamination on the activity and diversity of springtails in an ancient Pb–Zn mining area at Plombières, Belgium. *European Journal of Soil Biology*, 39 (1), 25–29.  
[https://doi.org/10.1016/S1164-5563\(02\)00006-7](https://doi.org/10.1016/S1164-5563(02)00006-7)
- Mertens, J., Beladjal, L., Janssens, F. & Matthys, P. (2007) Pitfall trapping in flooding habitats: a new technique reveals *Archisotoma pulchella* (Collembola: Isotomidae) as new to the Belgian fauna. *Belgian Journal of Zoology*, 137 (2), 177–179.
- Palacios-Vargas, G.J. & Janssens, F. (2006) Two new American species of *Paraxenylla* (Collembola: Hypogastruridae) and ecological notes. *Zootaxa*, 1312 (1), 37–47.  
<https://doi.org/10.11646/zootaxa.1312.1.3>
- Pfliegler, W.P. & Janssens, F. (2016) Checklist of Maltese Collembola with nomenclatural notes and new synonyms. *Soil Organisms*, 88 (3), 201–206.
- Potapov, A., Bellini, B.C., Chown, S.L., Deharveng, L., Janssens, F., Kováč, L., Kuznetsova, N.A., Ponge, J.-F., Potapov, M., Querner, P., Russell, D.J., Sun, X., Zhang, F. & Berg, M.P. (2020) Towards a global synthesis of Collembola knowledge: challenges and potential solutions. *Soil Organisms*, 92 (3), 161–188.
- Raimo, F., Miccio, G., Nicoletti, R. & Janssens, F. (2005) Danni da Collemboli su rucola selvatica (*Diplotaxis tenuifolia*). *Informatore Fitopatologico*, 55, 44–47.
- Vanhouornout, B., Janssens, F., De Bruyn, G., Mertens, J., De Clerck, K., D'Alba, L. & Shawkey, M. (2023) Rapid and reversible humidity-dependent colour change by water film formation in a scaled springtail. *Journal of the Royal Society Interface*, 20 (207), 20230228.  
<https://doi.org/10.1098/rsif.2023.0228>
- Vanhouornout, B., Rousaki, A., Parmentier, T., Janssens, F., Mertens, J., Vandenabeele, P.D. & Shawkey, M. (2021) Springtail coloration at a finer scale: mechanisms behind vibrant collembolan metallic colours. *Journal of the Royal Society Interface*, 18 (180), 20210188.  
<https://doi.org/10.1098/rsif.2021.0188>
- van Bezouw, R.F.H.M., McCulloch, J., Janssens, F. & Berg, M.P. (2022) An amended description of *Sminthurinus lawrencei* Gisin, 1963, with notes on the identification of black *Sminthurinus* species. *Soil Organisms*, 94 (3), 127–138.