

Science Life

MARIJA TAUJA-THIELMAN (1889–1975), A LATVIAN PLANT PHYSIOLOGIST, PROMOTER OF UNIVERSITY EDUCATION

In commemoration of her 120th anniversary

Gundega Ozoliņa

Marija Julianna Tauja (until 1936, Thielman; in publications: Thielman, Thielmann, Tauja-Thielman), was the founder of Plant Physiology as a scientific discipline in Latvia and was a long-time lecturer at the University of Latvia. She was born in 1889 into the farmer Fritz and Julianna Thielman family, in the Zemgale region of Latvia. The oldest child in the family, Marija took care of her sister and four brothers, from early childhood assisting her parents. In her lifetime, she never stopped caring selflessly for her relatives.

As was characteristic of many a Latvian farmer family in the early 20th century, all of the six Thielman children acquired higher education — in biology, medicine, jurisprudence, finance, architecture, and agriculture — in spite of difficulties.

Marija Julianna went to school in Rīga and Jelgava, and in 1907 graduated *cum laude* from the Jelgava High School for Girls. With the aim of studying history she went to St. Petersburg, the Russian Empire's capital, where she entered the Faculty of History and Philology at the Bestuzhev Higher Courses for Women, the first-ever Russian institution of higher education available for women.

After the first year of studies, however, disappointed at the great uncertainty that she found in the interpretations of historical events, Marija Julianna changed her field of study to biology at the Faculty of Physics and Mathematics. Exact sciences appealed more to her logical mind that strived towards both precision in research work and objectivity in interpretation of results.

In 1913, Marija Julianna Thielman graduated from the Bestuzhev Higher Courses for Women. The following year she passed external graduation examinations at the University of St. Petersburg (Russia), receiving a first-class diploma. She thus became one of the first Latvian women with university education. (Later, when more Latvian women had acquired higher education and in the 1920s the Latvian Academically Educated Women's Association was formed, Marija Thielman was among its founders and active members.) After graduation, Marija Julianna stayed with the Chair of Plant Physiology at St. Petersburg University and was granted a scholarship that enabled her to engage in scientific research work.

When the First World War broke out, the young scientist volunteered as a nurse at the war hospital of the Jelgava



Student M. J. Thielman, together with her brother Alexander, in St. Petersburg, Russia, 1910.



The young scientist M. J. Thielman worked as a nurse at a war hospital in Latvia, 1914.

Latvian Society. Later, to make use of her scholarship, she returned to St. Petersburg where she, under the supervision of Professor Sergei Pavlovich Kostychev, a representative of the famous Russian school of plant physiologists, engaged in research on plant respiration. The results were published in 1915 in the *Proceedings of the Russian Academy of Sciences*. For four ensuing years, Marija Thielman worked for various agencies of the Russian Ministry of Agriculture and the St. Petersburg Forest Research Institute where she lectured and conducted field work in plant physiology and anatomy, as well as conducted research on plant transpiration under natural conditions.

In 1920, Marija Thielman returned to Rīga and from November on worked as an assistant of the Chair of Plant Physiology and Anatomy at the Faculty of Mathematics and Natural Sciences of the University of Latvia.

In the summer of 1923, supported by a scholarship from the Latvian Cultural Foundation, she took the opportunity to conduct research in Berlin, as an apprentice to Professor Gottlieb Haberlandt, in whose institute at that time a new direction of research in plant physiology was developed, namely, the growth of isolated plant tissues and cells in artificial culture media. Back in Latvia, Marija Thielman continued this research and in 1924 published her results in a habilitation paper dealing with the culture of isolated stomata guard cells. The same year she was elected private assistant professor (*Privatdozent*) and began a lecture course in plant physiology at the University of Latvia. In the ensuing years she continued research on isolated tissue and cell cultures, mastered micro chemical research methods in the laboratories of Berlin and Vienna, and published the results in leading German and French journals of plant biology. In 1934, she was elected staff assistant professor, and in 1938, senior assistant professor. The attached-below list of her most significant publications refers mainly to this period of her life. (In the meantime, Marija Julianna had in 1936 changed her last name from the German “Thielman” to the Latvian “Tauja”.)

In 1939, Marija Julianna Tauja-Thielman’s life took a sharp turn, when she resigned from work at the Faculty of Mathematics and Natural Sciences (as she wrote later in her CV in



Assistant Professor M. J. Thielman and her colleagues, Faculty of Mathematics and Natural Sciences of the University of Latvia, the 1930s.

1955, due to fundamental disagreements with the Faculty authorities) and joined the Chair of Pharmacognosy, of the Faculty of Chemistry, where she was unanimously elected *Privatdozent*. There she delivered lectures and conducted laboratory research in plant anatomy and physiology for students of relevant specialties. Her scientific interest at that time focused on the physiology of medicinal plants.



M. J. Tauja-Thielman as Head of the Chair of Plant Physiology, University of Latvia, 1944–1955.

In the autumn of 1944, she returned, at the authorities’ request, to the Faculty of Biology, where she headed the Chair of Plant Physiology. She held the Chair until 1955 when it was merged with the Chair of Botany, in fulfilment of the order issued by the Soviet Union’s Ministry of Higher Education. (The two chairs were again separated in the academic year of 1958–1959.) Marija Tauja-Thielman continued lectures in plant physiology until her retirement in 1959.

In the post-Second-World-War period, Marija Tauja-Thielman was for a long time the only qualified specialist in plant physiology in Latvia; that is why her teaching work



M. J. Tauja-Thielman, 2nd from the right, 1st row, among her colleagues at the Faculty of Biology, University of Latvia, 1953.

embraced very broad student audiences. She taught students also at the Faculty of Chemistry, as well as at the Latvian Agricultural Academy; she also gave an introductory course in biology for first-year students of biology. For some time she headed also the Chair of Plant Physiology at the Latvian Agricultural Academy.

For several years after the Second World War, there was general lack of university textbooks, and the lectures delivered by the teaching staff were often the only available source of knowledge. Aware of the unsatisfactory state of affairs, and notwithstanding the enormous amount of teaching work that she did, Marija Tauja-Thielman still found time to translate into Latvian a university textbook, *Plant Physiology*, written by the outstanding Russian plant physiologist Nikolai Aleksandrovich Maksimov. Notably, the Russian original of the book (first published in 1927) has seen eight revised and supplemented editions. It has been translated into English, Spanish, German, Japanese, Ukrainian, and Georgian, and for many years was one of the world's most widely used university textbooks of its kind. The English translation of the second edition (published by McGraw Hill in 1930) was used widely in American universities. Marija Tauja-Thielman translated into Latvian the manuscript that the author had prepared for the eighth edition and had kindly given to her. As a result, the Latvian translation of the eighth edition of *Plant Physiology* by N. A. Maksimov appeared even earlier (in 1948) than did its Russian original. Thus, the Latvian university-level students received a fundamental textbook in a basic branch of biology. Marija Tauja-Thielman's contribution merits gratitude from many a user of this book.

Marija Tauja-Thielman's scientific activity during the post-Second-World-War period was connected with the physiology of medicinal plants, with especial focus on compounds of the glycoside group, saponins. She supervised many graduation and diploma works of students studying the influences of various factors, such as mineral nutrition, light intensity, growth stimulants, etc., on saponin contents in plant organs. Experiments on root meristem cultures have shown that saponins are synthesised in plant roots. Research on solanine contents in potatoes showed that removal of flowers did not increase the concentration of solanine in tubers. The results were reported at the University's scientific conferences. Regrettably, the huge amounts of research data were never formed into scientific publications.

Marija Tauja-Thielman's pedagogical work was never restricted to mere expounding of scientific facts. She paid due attention also to the clarity and precision of language, both written and spoken. When reviewing students' research papers, she scrupulously also corrected the language. Likewise, she paid much attention to correct speech. She always made her remarks in a non-offensive, scientific manner, such that the student easily memorised. Marija Tauja-Thielman took an active part also in the work of the Latvian Terminology Commission that convened once in a fortnight.

In Latvia, plant physiology suffered much during the Soviet period. Trofim Lysenko's pseudo-scientific theories acquired support from the official ideologies, and quite a few scientists used this for personal benefits. But Tauja-Thielman was often blamed for being apolitical in her lectures and for not emphasising the achievements of Soviet science. She, who had studied and continuously improved her knowledge through communication with truly outstanding Russian and European scientists, could not bring herself to accept scientifically ungrounded views.



M. J. Tauja-Thielman spent her vacations in a summerhouse in Jūrmala, often together with her young relatives, and her pet cat (photo taken in 1958).



Retired from work, M. J. Tauja-Thielman spent much time gardening at her summer home (photo taken in 1964).

In whatever situations I, as assistant co-worker, happened to be together with Assistant Professor Marija Tauja-Thielman, she always maintained non-intrusive self-respect, never humiliating herself with excessive self-criticism that was then so popular. She expressed her views but never imposed them, was unbiased in her scientific judgements as well as in her attitude toward every person around. Marija Tauja-Thielman's spiritual independence and honesty inspired deep respect, although she could at times show real womanly archness, too.

Assistant Professor Marija Tauja-Thielman passed away on 4 June 1975. She was buried in the Rainis Cemetery of the City of Rīga, Latvia.

Listed below are M. J. Tauja-Thielman's most significant publications:

Костычев С., Тильман М., Фрей Л. (1915). Об интрамолекулярном дыхании цветов ивы [On intra-molecular respiration of willow blossoms]. *Изв. Акад. Наук*.

Тильман М. (1919). О мучнистости и стекловидности зерна пшеницы [On mealiness and vitreosity in wheat kernels]. *Журнал опытной агрономии*.

Ivanoff, L., Thielman, M. (1923). Über den Einfluss des Lichtes verschiedener Wellenlänge auf die Transpiration der Pflanzen. *Flora*, **116**, 296.

Thielman, M. (1924). Über Kulturversuche mit Spaltöffnungszellen. *Ber. Deutsch. Bot. Ges.*, **42**, 429.

Thielman M. (1925). Über Kulturversuche mit Spaltöffnungszellen. *Arch. Exper. Zellforsch.*, **1**, 66.

Thielmann, M. (1925). Essais de culture des stomates. *C. R. Soc. Biol. (Paris)*, **92**, 888–890.

Thielman, M., Bērziņš, L. (1927). Über den osmotischen Wert kultivierter Pflanzenzellen. *Arch. Exper. Zellforsch.*, **4**, 273–327.

Thielmann, M., Bērziņš, L. (1928). Sur la valeur osmotique des cellules vegetales dans les cultures. *C. R. Soc. Biol. (Paris)*, **99**, 87.

Tauja-Thielman, M. J. (1938). Untersuchungen zur Wahl der Kohlehydrate für Explantationsversuche mit Pflanzengewebe. *Arch. Exper. Zellforsch.*, **21**, 477–522.

Tauja-Thielman, M. J., Pelēce, E. (1940). Wachstum isolierter Wurzelspitzen in heteroauxinenthaltenden Nährlösungen. *Arch. Exper. Zellforsch.*, **24**, 1–26.

Tauja-Thielman, M. J. (1941). Über Stärkebildung aus Zuckerarten in Blattgewebeschnitten. *Beih. Bot. Centralbl.*, **59**, 310–328.

Tauja-Thielman, M. J., Frišenfelde, L. Über den Chloroplastengehalt der Epidermzellen von Laubblättern. (Manuscripter)

For the Latvian reader, the following publications pertaining to Marija Julianna Tauja can be of interest:

Ikere, Z. (1992). Gudras sievietes gudrību neslēpj [Wise women don't hide their wisdom]. *Laikr.: Diena*, 1992. g. 30. jūlijā, 6. lpp. — Although this article does not mention her name, it comprises a 1938 photo of Marija Tauja amid others, as an active member of the Latvian Association of University Women.

Dzērve, M. (1994). Zemgaliete Marija Tauja (Tilmane). Sievietes personības tapšanas ceļš latviešu tautas Otrās atmodas laikā 20. gadsimta sākumā, — kā tas atspoguļojas viņas pašas rakstos [Marija Tauja (Tilmane), a woman from Zemgale. An early-twentieth-century Latvian woman's individuality/character in the making — as reflected in her own writings]. *Grām.: Latvijas sieviete valsts 75 gados*. Rīga: Zvaigzne, 142.–160. lpp.

Ozoliņa, G. (2008). Augu fizioloģei Marijai Taujai — 120. Akadēmiskās izglītības kopēja [Plant physiologist Marija Tauja, a promoter of university education. In commemoration of her 120th anniversary]. *Grām.: Daba un vēsture 2009*. Rīga: Zinātne, 124.–128. lpp.

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AUGU FIZIOLOĢEI MARIJAI TAUJAI – 120

Augstākās izglītības kopēja

Marija Tauja (dzim. Tilmane, uzvārdu latviskojusi 1936. gadā), augu fizioloģijas kā zinātnes iedibinātāja Latvijā, ilggadīga Latvijas Universitātes docētāja, dzimusi 1889. gada 17. janvārī zemkopju ģimenē Jelgavas apriņķa Šķībes pagasta „Jēģeros”. Absolvējusi ar zelta medaļu Jelgavas sieviešu ģimnāziju, Marija studēja Pēterburgas Bestuževa Augstāko sieviešu kursu Fizikas un matemātikas fakultātes Bioloģijas nodaļā, kuru beidza 1913. gadā. 1914. gada pavasarī viņa Pēterburgas Universitātē nolika eksterna eksāmenus un ieguva šīs universitātes pirmās šķiras diplomu, tā kļūdamā par vienu no pirmajām akadēmiski izglītotajām latviešu sievietēm. Viņu atstāja darbā pie Augu fizioloģijas katedras, piešķirot stipendiju, lai sagatavotos zinātniskam darbam. Pirmā pasaules kara sākumā jaunā zinātniece strādāja Jelgavas Latviešu biedrības lazaretē par žēlsirdīgo māsu; vēlāk atgriezās Pēterburgā, profesora S. Kostičeva vadībā piedalījās pētījumos par augu elpošanu un strādāja dažādās zinātniskās iestādēs.

1920. gadā M. Tauja atgriezās Rīgā un sāka strādāt LU Matemātikas un dabas zinātņu fakultātes Augu fizioloģijas un anatomijas katedrā par asistenti, vēlāk docenti un vecāko docenti. 1923. gadā viņa stažējās Berlīnē pie prof. G. Hāberlanda, specializēdamās tolaik jaunajā augu fizioloģijas nozarē – izolētu audu un šūnu kultivēšanā. Kopš 1944. gada viņa bija LU Bioloģijas fakultātes Augu fizioloģijas katedras vadītāja, kur strādāja līdz aizīšanās pensijā 1959. gadā.

Tā kā pēc Otrā pasaules kara docente M. Tauja bija palikusi vienīgā kvalificētā augu fizioloģijas speciāliste Latvijā, viņa lasīja augu fizioloģijas vispārīgo kursu un spekcursus ne tikai savā pamata darba vietā, bet arī LU Ķīmijas fakultātē un Latvijas Lauksaimniecības akadēmijā. Par spīti milzīgajai pedagoģiskajai slodzei, docente atrada laiku arī tam, lai pārtulkotu izcilā krievu augu fiziologa N. Maksimova augstskolu mācību grāmatu „Augu fizioloģija”. Šī grāmata, tulkota vairākās valodās, ilgus gadus ir bijusi viens no visā pasaulē populārākajiem mācību līdzekļiem savā nozarē. M. Tauja šo grāmatu ir tulkojusi no 8. izdevumam sagatavotā manuskripta. Latviešu valodā šī grāmata iznāca 1948. gadā, agrāk nekā oriģinālā.

Docentes M. Taujas zinātniskajā darbībā izšķirami divi posmi – divdesmitā gadsimta 20. un 30. gados viņa pētīja atvārsnīšu slēdzējšūnu audzēšanas iespējas mākslīgās barotnēs. Turpmākajā laikā viņa pievērsās ārstniecības augu fizioloģijai, vispusīgi pētot glikozīdu grupas savienojumu saponīnu uzkrāšanos augu orgānos. Lielu uzmanību docente veltīja valodas izteiksmes skaidrībai un precizitātei. Ar lielu rūpību viņa lasīja studentu kursa darbus un diplomdarbus, kā arī regulāri piedalījās terminoloģijas komisijas sēdēs.

Mūžībā Marija Tauja aizgāja 1975. gada 4. jūnijā, apglabāta Raiņa kapos Rīgā.