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PRESIDENT’S MESSAGE

Dear IPPS members,

I hope you are all doing well at the time you receive issue 88 of Haustorium. As the president of the International Parasitic Plants Society (IPPS), traditionally I have the honor and pleasure of addressing a message in each new issue.

Allow me to start this message with some housekeeping announcements.

I guess the most important announcement concerns the 18th World Congress on Parasitic Plants (WCPP), to be held in Brazil next year. There has been a change in venue and date for our conference. In the previous issue of Haustorium I announced the WCPP to be held at Ilhabeha from 14-21 June, but this has now been changed to **São Sebastião from 31 May to 5 June 2026**. The change of date was decided because of a conflict with the 6th International Symposium on Broomrape in Sunflower, organised by the International Sunflower Association and held in Novi Sad, Serbia. We apologise for this late change in date and hope everyone interested in attending the 18th WCPP can still make it. More on this conference will be announced soon on our website.

In the previous issue I also announced the retirement of Julie Scholes and Koichi Yoneyama from the IPPS advisory board. We are still looking for their replacements and I hope to be able to announce their names in next issue of Haustorium.

The current issue of Haustorium is again packed with newsworthy items on our beloved parasitic plants, including an invited essay by Jonathan Gressel, highlights from the literature, an overview of press reports, future meetings and parasitic plant theses. In addition, there still is the unanswered question from Chris on the differential infection symptoms of *Striga asiatica* and *S. hermonthica*. Is this indeed a commonality and what may be the reason for this?

Chris also raised his concern about the future of Haustorium. The editors, Lytton and Chris himself (supported by EC-member Thomas), are obliged to pass on the editor-baton to a new editor in the near future. I herewith call for any volunteers to take over from them. You can send me or Chris an e-mail if you have thoughts on this.

I wish you all a good read and my (very) early mistletoe-season greetings!

Jonne Rodenburg, IPPS President.

INVITED ESSAY

Exorcizing witchweed – are the latest advances applicable in the field?

Instead of dealing with the excellent basic research on *Striga*, this article critiques the progress as if through the jaundiced eyes of a farmer who has a serious infestation and needs a novel control technology. On the one hand we have been led to believe that the situation has been solved by news releases of various international institutions, academic labs as well as titles of seminar presentations by various researchers in the last year or so. Conversely there are the recent papers published with the actual data achieved. Here we ask: are the solutions cost-effective; have they compared their solutions to others’; will they work in the field under high infestations; will they actually prevent *Striga* from replenishing the seed bank? As seen below, this crotchety old self-appointed representative of farmers is not enthusiastic about most of the progress and much of the recent research continues repeating past efforts that had limited success. Too much of the new generation of researchers seems in many cases not to have learned from past experience

repeating the same type of solutions that were proposed as 'promising' even before this reviewer became peripherally involved with parasitic weeds.
The following is highly condensed and somewhat modified version dealing with three technologies from a more comprehensive crtitique published in Pest Management Science.[1] This reviewer had hoped to see progress in the area of host-induced gene silencing,[2] an area that he considers has great potential, but could find no progress.

Suicidal germination stimulants
Decades have gone into synthesizing stimulants that induce suicidal germination, and many have been highly effective in laboratory situations. Until recently, none have been successful in the field due to their very short half-lives. This has changed by using an undisclosed proprietary formulation that keeps the germination stimulants active in soil for a sufficient duration to be effective. Experiments in western Kenya using the formulated stimulants led to *Striga*-free maize plots within three heavily infested field sites.[3] Is this practical? One must look carefully at the experimental protocol. The experiments began with the first rains needed to hydrate the *Striga* seed and continued over a two-week period ('preconditioning') before applying the newly formulated stimulants. After preconditioning the *Striga* seed would typically either germinate when chemically induced by a compatible host root, and if not redry until next preconditioned. After preconditioning there were two spaced applications of the formulated stimulants and the *Striga* was given time to germinate and die due to lack of host. The maize crop was finally planted, almost three months after the onset of rainfall, when maize is usually planted at the beginning of a rainy season.[3] As yield comparisons were not presented, the yield penalty for such late planting is unclear, but was almost certainly significant. This technology might be made cost effective if the stimulants are not phytotoxic to the crop, and a pre-emergence herbicide that selectively kills germinated *Striga,* but not the crop is sprayed on the field or preferably as a crop seed treatment. This would allow earlier planting of the crop.

Gene editing
This elegant approach utilizing the latest tools of biochemistry and molecular biology was used to mutate two root transporter genes and thus prevent strigolactone germination stimulator from being secreted by host crop roots.[4] This should overcome the increased tillering and other side effects of reducing total strigolactone biosynthesis in other recently published experiments using gene editing.[5] The two sorghum strigolactone transporters were identified by transcriptomic and functional analyses, and protein modeling was used to elucidate the conserved amino acids required for function of the transporters. Based on this information, single and double knockouts were generated by gene editing.[4] In the 2-year field experiment emerged *Striga* was ca. 70-80% suppressed in both the single knockouts and >95% in the double transporter knockout. The most important information for the growers comes from the field yield data: When infested with *Striga*, the un-edited control plots incurred ca. 70% yield loss, while plots with the single and double mutants had a yield loss of just 15% and 10%, respectively compared to *Striga*-free conditions.

How will this technology[4] transfer from China where the research was performed to Africa where *Striga* resistance is needed? A comparison of conditions does not allow for rosy predictions, except possibly for the double knockout: The Chinese field experiments[4] were performed with the less virulent *Striga asiatica* and not the *Striga hermonthica* predominant in Africa. The seeding density used in the Chinese field experiments cited was 4200 seeds per square meter, orders of magnitude less than is present in heavily-infested African fields. Thus, there may be enough *Striga* seeds in African fields close enough to the gene-edited host root to be stimulated to germinate by the minuscule amount of stimulant secreted.

As there normally is enhanced strigolactone secretion under phosphate deficiency, one wonders whether these gene edited plants will require more phosphate fertilizer than un-edited plants when the plants are cultivated in the non-ideal situation of the nutrient deficient farmers' fields, another unanswered question. Will the enhanced yield compensate for the cost of fertilizer and seed? Will other technologies available be more cost-effective? The authors should also remember the earlier studies where it was found that breeding low stimulant producing lines were only useful in heavily infested fields when genetically stacked with resistances at later stages.[6] Equally elegant gene editing similar to what has been performed[4] is needed to edit the prevention of haustorial formation and penetration, as well as establishment of the parasite. All the edited traits stacked together would provide robust *Striga* control that is recalcitrant to the parasite evolving resistance.

Biocontrol agents

In the bleak background of decades of 'promising' reports on *Striga*-killing biocontrol agents that never made it to the field, the work of one group stands out. Their work resulted in a registered commercial product containing a *Striga*-specific *forma specialis* of a *Fusarium oxysporum*.[7] Success was achieved because this group fulfilled the four requirements for a successful biocontrol agent:[8] the fungus was mutated to become hypervirulent to increase its efficiency; they cultivated the inoculum inexpensively in liquid culture; they formulated the inoculum on the crop seed with sufficient nutrients for it until it encounters *Striga*; and they demonstrated to regulators that it is host specific and thus biosafe.[7] There is a good possibility that a crop with this organism growing on its rhizoplane will also be protected from invasion by other root pathogenic fungi,[9] precluding the need for fungicide treatment of the crop seed.

Concluding remarks

One might erroneously get the impression that *Striga* is the only weed problem from photos of excellent *Striga* control in crops. The fields were hand-weeded to remove all other weeds prior to photographing. Solutions are simultaneously needed for these other weeds as well as insect and disease problems, as dealing with *Striga* is insufficient for the farmer – a *Striga* free field can be devastated by fall army worms or other pests and diseases.We also have the questions of how applicable are solutions from one crop to another, from one locale to another, as well as how long will given solutions will remain usable due to the highly intraspecific diverse *Striga* species[10] evolving resistance. Clearly crops with multiple stacked solutions will be more likely to overcome these diversity issues.

Acknowledgement

The author thanks Chris Parker for stimulating him to take a critical look at the most recent research.

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This is an excerpt from the article by Gressel in Pest Management Science, listed at 1. above.

LITERATURE HIGHLIGHT

Rethinking the rules of plant life cycles: insights from the Rafflesiaceae

We were intrigued by Ng's (2025) compelling observations of Rafflesiaceae dissections, which challenge views of seedling development and indeed, plant life cycles more broadly. Building on the author's anatomical insights, we offer an integrated molecular and genomic perspective on the results presented, and challenge perceptions of what defines a flowering plant.

Ng, F. S. P. (2025). The reproductive biology of Rafflesiaceae. Journal of Tropical Forest Science, 37(2), 131–139. Forest Research Institute Malaysia. Stable URL: https://www.jstor.org/stable/10.2307/48817006

1. A radicle thought: does germination mean more than just seedling development?
Ng argues that Rafflesiaceae seeds do not germinate because there they do not feature radicle emergence. We propose a broader interpretation: germination also includes imbibition and metabolic activation, even in the absence of seedling formation (Nonogaki *et al.*., 2010). Our seed transcriptome study (Molina *et al.*., 2023) revealed minimal expression of canonical ABA–GA regulators, but strong auxin signalling -atypical for classical germination. Auxin, known to regulate cell division, has a role in haustorium development in *Phtheirospermum japonicum* (Wakatake *et al.*., 2020), suggesting that the 'pro-embryonic cell strands' observed in *Rafflesia* may be auxin-driven. Expression of ethylene response genes (ETR, ACC-related enzymes) in *Rafflesia* seeds (Molina *et al.*., 2023) may also echo findings in *P. japonicum* in which ethylene affects haustorium initiation (Cui *et al.*., 2020). In *Triphysaria*, the ethylene precursor ACC also induces haustorium formation (though only within a specific concentration range and in the presence of DMBQ, Tomilov et al. 2005). While Rafflesiaceae seeds bypass the 'conventional' seedling stage, they may undergo a distinct form of germination—functionally akin to fungal spores that form (Thorogood *et al*., 2021), in response to specific host cues. Examining these processes in Rafflesiaceae gives us a broader perspective on early development in plants.

2. Morphological divergence and the limits of dissection
Ng argues that his careful dissections of Rafflesiaceae show no evidence of a shoot apex or epicotyl – structures that would normally initiate seedling development in plants. He concludes that all organs of Rafflesiaceae arise directly from a protocorm-like mass of cells within the host, bypassing the conventional seedling stage altogether. These observations are valuable and interesting; but they must be interpreted in the context of extreme morphological divergence. The Rafflesiaceae have departed radically from the typical angiosperm bauplan and so we should not expect to see all of the structures common to photosynthetic plants. As Nikolov *et al.*. (2013) demonstrated, gene expression patterns - not morphology alone - reveal the underlying developmental identity of Rafflesiaceae floral organs. Molecular evidence provides the most reliable insight into the family's evolution.

3. Shooting in the dark: propagation hampered by sporadic endophyte development

Ng suggests that if the vegetative body in Rafflesiaceae truly ramified throughout host stems (Kuijt, 1969), vegetative propagation of infected host material should be straightforward. Yet, in practice, such propagation has rarely been successful (Mursidawati *et al..*, 2015; Molina *et al..*, 2017). We note, however, that the endophytic phase of Rafflesiaceae is not a continuous, mycelium-like network; rather, it occurs sporadically as single cells or tiny clusters confined to select host roots or stems (Nikolov *et al.*, 2014; Mursidawati *et al.*, 2019; J. Molina, pers. obs.). This cryptic, patchy distribution makes propagation attempts akin to 'shooting in the dark': the chance that any given host cutting contains hidden parasitic cells is exceedingly low. Such sporadicity of the endophytes offers an explanation for repeated failures in cultivation. Examining endophyte development sheds light on propagation in what is a notoriously intractable family – and this may advance conservation success.

4. Genomic evidence of angiosperm identity

The Rafflesiaceae is a remarkable example of plants that have lost their plastid genomes (Molina *et al*., 2014; Cai *et al.*. 2021). This may prompt the question: *when is a plant no longer a plant*? (Pennisi 2014). Yet phylogenomic studies place the family confidently within the Malpighiales (Davis *et al*., 2007). To create a new group ('Rafflesiosperms') according to Ng (2025) based on the absence of classical angiosperm anatomical features doesn't take into account these plants' extraordinary evolutionary journey: their extreme reduction is the consequence of their obligate parasitism on *Tetrastigma,* likely dating back to the Eocene (Xi *et al.*, 2013).

Conclusion

Rafflesiaceae defies traditional definitions. These are plants that lack seedlings, chloroplast genomes, and 'conventional' plant bauplan morphology - yet molecular and genomic analyses affirm the family's place in the tree of life. These plants' evolutionary identity is encrypted and obscured by their bizarre morphology – but it can't be erased. Integrating traditional techniques such as anatomy and dissection, with advanced technologies such as transcriptomics and phylogenomics, is steadily moving the dial on our understanding of the world's least plant-like plant.

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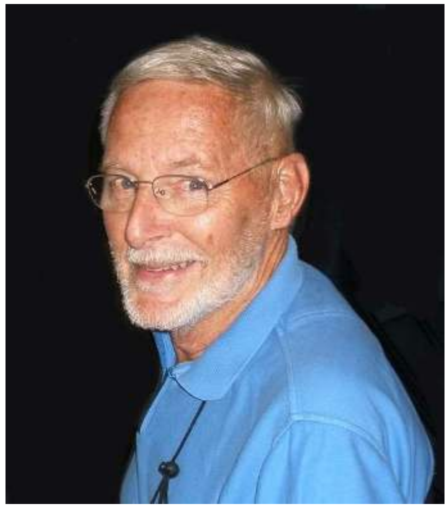
OBITUARIES

A Tribute to Dr. Mistletoe

The world of parasitic flowering plants has lost one of its most influential members. On December 15, 2024 Job Kuijt passed away in the presence of his family members. Job was born May 25, 1930 in Velsen Municipality, the Netherlands. He immigrated to British Columbia Canada in 1948 and received his Ph.D. from the University of California, Berkeley in 1958. His productivity thereafter can only be described as extraordinary. Beginning in 1968 he became an Associate Professor in the Department of Biological Sciences at the University of Lethbridge, Alberta where he remained until 1989. In 1969, his book 'The Biology of Parasitic Flowering Plants' was published by the University of California Press. Like many others, this has been a resource I have consulted since I was a graduate student. Up until that point, no synthesis of the scattered information on these plants was available, and indeed much of the literature was not in English. Job's proficiency in English, Dutch and German, plus his love of parasitic plants, placed him in a unique position to write the book.



Job Kuijt at the Botany 2009 meeting in Snowbird, Utah, July 29, 2009. Photo by D. L. Nickrent.

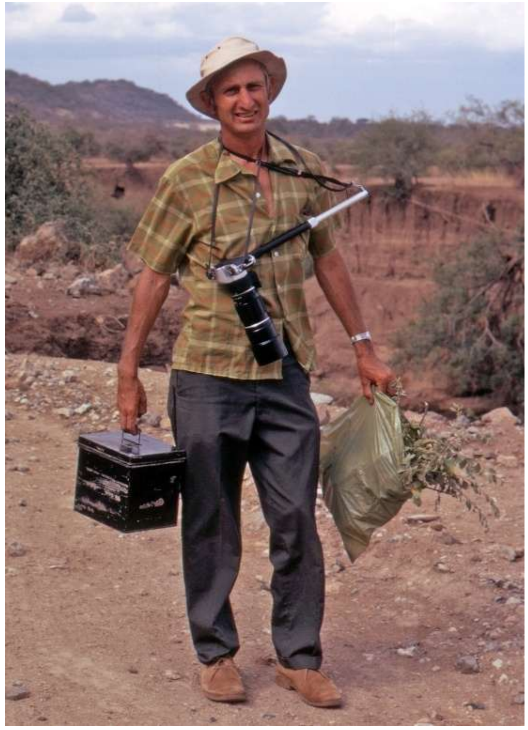
His particular specialties were plant taxonomy, anatomy, and development and these topics constituted the lion's share of his publications, which number over 200. What is most remarkable is that two-thirds of his publications were single-author papers distributed across 47 different journals. Job published on many groups; however, his major focus was Santalales, specifically the New World mistletoes in Loranthaceae, Viscaceae and Santalaceae. Although he liked to represent himself as a ‘classical’ botanist’, a look at his coauthored publications shows his interests stretched beyond this definition (e.g., chemical composition of viscin, cytochemistry of haustorial endophytes, various ultrastructural studies, and even molecular phylogenetics). This tribute would be incomplete if no mention was made of Job's incredible artistic ability. He used stippled line art in a consistent and recognizable style that captured the aspect and essence of the plant being observed. These illustrations will provide valuable and essential taxonomic information to specialists well into the future. In his lifetime, Job was able to witness many changes and advancements in parasitic plant research, and I acknowledge that much of my work began by standing on his shoulders.

Daniel Nickrent
Cornell University

Remembering Delbert Wiens

This year marks the passing of another major figure in the history of parasitic flowering plant research. On March 21, 2025, Delbert (Del) Wiens passed away in Boise, Idaho at age 93. Del can be best remembered as an explorer, both within the realm of science but also in his personal life. His curiosity about the natural world took him to six continents allowing many botanical as well as (later) seafaring adventures. Del was born on July 9, 1932 in Munich, North Dakota. He received a BA in 1955 from Pomona College, Claremont, CA and two years later an MS degree from the University of Utah, Salt Lake City. In 1961 he earned his doctoral degree from Claremont Graduate School. In 1960 he began teaching at the University of Colorado, Boulder and from 1962 to 1964 he was an Assistant Professor there. In 1964 he assumed the position as Associate Professor in the Biology Department, University of Utah, Salt Lake City and was promoted to Professor in 1974. He remained at this institution for the rest of his career.

Del's publications number over 100 with his earliest papers documenting chromosome numbers in *Mimulus*, and soon after, mistletoes in Loranthaceae and Viscaceae. In 1964 Del teamed up with Frank Hawksworth and published a new species of mistletoe (*Arceuthobium gillii*) from Arizona. This productive collaboration continued until Frank's death in 1993. In 1972, along with Frank, Del coauthored ‘Biology and Classification of Dwarf Mistletoes (*Arceuthobium*)’ that was updated in 1996. This book was the primary resource for many workers thereafter because of the massive amount of information it contained on these plants.



Del Wiens collecting mistletoes in Namibia, 1976. Photo by Carol Wiens

During Del's career he pursued two parallel tracks, plant cytology and reproductive biology as well as the taxonomy of mistletoes. In 1981 he coauthored a paper on ovule abortion in *Cryptantha* (Boraginaceae) and three years later a more general paper linking this observation to life history, breeding systems, and reproductive success in plants. This line of investigation led him to studying *Dedeckera*, a monotypic genus in Polygonaceae endemic to the Inyo and White Mountains of California. Ironically, the genus is named after Mary DeDecker, Del's mother-in-law, who discovered the plant in 1974. Studying the genetic component of extinction captured Del's interest for the remainder of his career, culminating in his 2020 paper in Quarterly Review of Biology. Del teamed up with Roger Polhill and, through extensive field work across Africa, coauthored 'The Mistletoes of Africa' published in 1998. This invaluable contribution is important not only to specialists but also a more general audience given it is richly illustrated with both line art and color photographs of these spectacular plants. Appropriately, three species of mistletoe were named in Del's honor: *Phoradendron wiensii* Kuijt, *Psittacanthus wiensii* Kuijt, and *Taxillus wiensii* Polhill.

Daniel Nickrent
Cornell University

THE FUTURE Of HAUSTORIUM

I have been involved in Haustorium since its inception in 1979 and continue to enjoy assembling an issue every 6 months or so. I expect to be able to continue for a while yet but I have to be realistic! My age and domestic responsibilities are likely to become more demanding as time goes on. Lytton Musselman is likewise having to face up to reality and a new co-editor is needed.

Is Haustorium worth continuing (with or without the LITERATURE section?)

I will welcome comment and, ideally, an offer to become a co-editor with a view to taking over in due course.

Chris Parker.

IPPS WEBINARS

June 4, 2025

Jessy Lasky – Pennsylvania State University, USA
'Genetics, physiology, and evolution of sorghum resistance and *Striga* host adaptation'

Yu Feifei – China Agricultural University, China
'Resistance to *Striga* parasitism through reduction of strigolactone exudation'

July 2, 2025

Bing Wang – Innovation Academy for Seed Design, China
'Manipulation of a strigolactone transporter in tomato confers resistance to the parasitic weed broomrape'

Tao Chen – Hangzhou Normal University, China
'Mechanism and breeding of sunflower resistance to broomrape'

September 3, 2025

Ai-Rong Li – Kunming Institute of Botany, Chinese Academy of Sciences, China
'Unlocking the cultivation secrets of a valuable root hemiparasitic plant *Malania oleifera* (Olacaceae): From ecological adaptation to molecular regulation'

Run-Xian Yu – PhD student of Institute of Botany, Chinese Academy of Sciences, China
'Cultivating the unseen: secrets of parasitic plant gardening'

October 1, 2025

Guojing Shen – Kunming Institute of Botany, Chinese Academy of Sciences, China
'Unraveling *Cuscuta*-host interactions: hormone/receptor-mediated host resistance and dual-functional resin glucosides from *Cuscuta*'

Laia Jenné – University of Barcelona, Spain
'Parasitic plants as a window into the evolution of photosynthesis and photoprotection: vitamin E as a case study'

November 5, 2025

Guillaume Brun – Institute for Evolution and Biodiversity, University of Münster, Germany
'Seed metabolites headstart haustoriogenesis and potentiate aggressiveness of parasitic weeds'

Martina Leso – Swedish University of Agricultural Sciences, Sweden
'Regulating haustoria numbers in facultative parasites: long-distance cytokinin signalling in *Phtheirospermum japonicum*'

Abstracts are available to IPPS members on the IPPS website:
https://www.parasiticplants.org/members-only-area/seminar-series-2/

CONGRATULATIONS

Steven Runo elected to the IS-MPMI board.

Prof. Steven Runo from Kenyatta University has been elected to the board of the International Society for Molecular Plant-Microbe Interactions (IS-MPMI). His appointment will help to bring more attention to parasitic plant research within the scientific community.

PRESS REPORTS

Leafless and mysterious parasitic plant survives by stealing water from other plant.

Botanists have formally described a new parasitic plant from the Canary Islands, *Orobanche andryalae*, after two decades of field work and very patient verification. It is a tiny member of the broomrape group that taps the roots of other plants for water and nutrients, then blooms with understated charm on harsh volcanic ground. It took time, care, and a steady hand to show it really was something new.

A

Orobanche andryalae in cultivation at the University of Oxford Botanic Garden

The species stands out by a distinctive set of floral traits, including a markedly cernuous, or nodding, corolla and a high point where the filaments attach inside the flower, features that hold steady even when cultivated. It grows on thermophilous, or heat loving, volcanic substrates and shows a tight association with *Andryala* species as hosts, a combination recorded in northern Lanzarote, northwest Tenerife, and the Jandía area of Fuerteventura.
The authors also provide an identification key for the Canary Islands' broomrapes, a practical step that will reduce future mix ups in this tricky genus.

Researchers watched *O. andryalae* in the wild over 23 years, logging five plants at a population near Yé and about 40 near Haría on Lanzarote between 2020 and 2022, which helped map its patchy presence and year to year swings. They then raised the parasite from seed on its host at the University of Oxford Botanic Garden

to confirm that the key traits remain constant in cultivation, an important check when field conditions can blur the picture.
O. andryalae sits in a cluster of small flowered species where fine details of floral shape and hair patterns matter, and where different names have historically been applied to similar faces. Taxonomists have long flagged that this subsection is hard to resolve with morphology alone, especially when pressed herbarium specimens lose color and nuance.

Past research on broomrape biology shows why confusion arises. Local lineages can evolve to prefer particular hosts, which leads to look alike plants with different genetic backstories. Experimental work has also documented host specific races in *Orobanche minor*, a close relative, offering a useful model for how host choice can shape divergence in parasitic plants. In that context, the authors' combined approach, blending stable floral characters, host identity, and ecology, makes the case for species status without waiting on a perfect phylogeny. The careful cultivation step further strengthens it, because it shows the defining traits are not just environmental artifacts.

Based on today's records, the species occurs in few localities and in low numbers, so the authors recommend treating it as 'Data Deficient' until long term surveys reveal more, a cautious call that respects limited data while flagging potential concern. *Orobanche* seed banks can, however, remain viable for decades. Apparent absences may hide dormant populations that can reappear when conditions swing in their favor. The main host, *Andryala perezii*, is locally common within a narrow range on Lanzarote and Fuerteventura, which hints that more parasite sites may be found as surveys intensify and as botanists check associated Asteraceae more closely.

The study is published in *PhytoKeys* (see Thorogood *et al.* 2025 below.)

Jordan Joseph
For Earth.com

IITA, JOSTUM release another high-yield cowpea variety

The Joseph Sarwuan Tarka University Makurdi (JOSTUM), in collaboration with the International Institute of Tropical Agriculture (IITA-CGIAR), has released a new cowpea variety to Nigerian farmers for commercialisation.

Our correspondent reports that the new variety named FUAMPEA 5 (Alkam super) is a high-yielding *Striga*-resistant variety with desirable seed and consumer sensory qualities for Nigerian farmers' delight. According to him, the new variety had undergone several multi-locations and on-farm trials that spread across different agro-ecological zones in Nigeria (Makurdi in Benue State, Biu in Borno State, Zaria in Kaduna State, Mokwa in Niger State, Ganjwa in Bauchi State, and Abuja in the FCT).
Omoigui explained that FUAMPEA 5 has an impressive yield increase of 139 percent over the traditional landrace, 'Madara', and a 39 percent yield increase over the current improved variety, SAMPEA 19.
'It is poised to make a real difference in farmers' fields. The potential yield of the new variety is 2.9 tons/ha and has an indeterminate growth habit. 'This significant yield boost is expected to transform the lives of cowpea farmers in Nigeria, providing them with a more productive and resilient crop. In addition, the new variety possesses most of the quality traits desired by farmers and the market. The seed quality is attractive and appealing to consumers.'

Weekly Trust

WSDA seeks help from sunflower growers after first North American detection of sunflower broomrape confirmed in Yakimad.

Orobanche cumana (Courtesy photo)

YAKIMA, Wash. — The Washington State Department of Agriculture (WSDA) has confirmed the first-ever North American detection of *Orobanche cumana*, commonly known as sunflower broomrape, in Yakima, WA. This marks the first known occurrence of this destructive and highly invasive parasitic weed in North America.

The parasitic plant was discovered by a homeowner and later confirmed by the WSDA State Plant Pathology and Molecular Diagnostic Lab and USDA Animal and Plant Health Inspection Service (APHIS). Confirmation included both morphological and molecular analysis. Sunflower broomrape is a devastating root parasite of sunflower (*Helianthus annuus*) and other members of Asteraceae (the sunflower family), leading to significant crop losses. The plant is incapable of photosynthesis and relies entirely on the host plant for water and nutrients. This detection is especially concerning due to the aggressive nature of this parasitic weed and its potential to spread rapidly if left unmanaged. Sunflower broomrape poses a serious threat to commercial sunflower production and could cause significant impacts to growers, processors, exporters and the agricultural economy if not swiftly contained.

The WSDA Pest Program is working closely with USDA and local stakeholders to investigate the source, assess the extent of the infestation, and implement response measures to protect North American agriculture. WSDA is seeking help from the public to identify the other possible introductions of this invasive pest. If you suspect you have seen sunflower broomrape, **do not disturb it** as doing so may cause the seed to spread. Instead, photograph the suspected sighting and report it to WSDA immediately. Report suspected sightings to WSDA immediately by emailing pest@agr.wa.gov or calling 1-800-443-6684 (option 1). Reports should include the reporting party's name, location of the suspected weed, date encountered, and photos.

Native to Eurasia, *Orobanche cumana* is a quarantine pest in many countries due to its devastating impact on sunflower production. Although *O. cumana* attaches to the host plants' roots, it does produce distinctive above-ground, leafless flower stalks. A single plant can produce hundreds of thousands of microscopic seeds that remain viable in the soil for decades, making eradication difficult once established.

WSDA will continue to coordinate with USDA APHIS and affected stakeholders to implement mitigation strategies and determine the potential regulatory implications. Public outreach and grower engagement will be part of the integrated response plan.

Morning AgClips, October 2, 2025.

Deadwood brings wild orchids to life.

Deadwood-decomposing fungi feed germinating orchids, providing the carbon their tiny seeds don't have. The Kobe University finding not only closes a gap in our understanding of wild orchid ecology but also uncovers an important carbon flux in the ecosystem.

Close-up of *Cremastra variabilis* seedlings (white) entwined with fungal hyphae near decaying wood, illustrating how wood-decomposing fungi sustain seedling growth. © INUI Kazuki (CC BY)

Orchid seeds are as small as dust and do not provide any nutrients for the young plant to grow. The adult plants are known to rely on a certain type of fungi that develop structures within the plant's roots, but whether these same fungi also help with germination has not been established. 'Studying orchid germination in nature is notoriously difficult. In particular, the painstaking methods required for recovering their seedlings from soil explain why most earlier studies focused only on adult roots, where fungi are easier to sample,' explains Kobe University plant evolutionary ecologist SUETSUGU Kenji.

During fieldwork, Suetsugu's team noticed a strange pattern. He says: 'We repeatedly found seedlings and adults with juvenile root structures near decaying logs, not scattered randomly in the forest. That recurring pattern inspired us to test whether deadwood fungi fuel orchid beginnings.' These juvenile root structures are coral-shaped rhizomes and have been interpreted as a seedling's organ retained into adulthood — and they are often associated with wood-decaying fungi rather than with those found in adult orchids without these structures. Being experts in orchid ecology and evolution, Suetsugu's team took on the challenge to find out who feeds the young orchids.

In the journal *Functional Ecology*, the Kobe University team report that amongst seeds of four model orchid species they buried in various forest locations, they observed germination only near decaying logs, and that the seedlings virtually exclusively associated with wood-decaying fungi. 'We were struck by how exclusive and consistent these fungal partnerships were. There is an almost perfect match in the fungi that seedlings of a given orchid species associate with and the fungi on adult plants with coral-shaped rhizomes of the same species. We think that the plants without coral-shaped rhizomes shift to other fungi as their nutritional needs change during growth and the carbon source offered by rotting logs dries out,' says Suetsugu.

Among the relatives of the orchids the Kobe University team studied, there are many species that have independently evolved full mycoheterotrophy, that is, they have abandoned photosynthesis and instead feed on fungi throughout their lives. ‘The propensity of these orchids to maintain their association with wood-decaying fungi into adult life probably facilitated their evolution of full mycoheterotrophy,’ Suetsugu says.

In the paper, the team writes, ‘As woody debris represents a major carbon source in forests, associations with wood-decaying fungi may enhance carbon acquisition, especially in warm, humid habitats.’ Suetsugu adds: ‘For conservation, our results mean that protecting orchids in the wild is inseparable from protecting deadwood and its fungi. For ecological sciences, they reveal a hidden carbon route from deadwood to green plants, explaining how seedlings can establish themselves on dark forest floors. And they show that deadwood is not dead — it is a cradle of new life.’

Kobe University 8 October, 2025.

Discovery of dazzling blue butterfly underscores peril facing Angola’s forests

Francis’s gorgeous sapphire — a new-to-science species of butterfly — has just been described in the high-altitude evergreen forests of western Angola. The identification of *Iolaus francisi*, with its shimmering blue upper wings bordered with black, and silvery underwings patterned with orange and brown lines highlights once more the rich biodiversity of the country’s most threatened habitat.
Ecologist Alan Gardiner recalls the exciting moment he and Zimbabwean lepidopterists Jonathan Francis and Shabani Ndarama first saw a male sapphire shining in a forest patch during an expedition to the Namba Mountains in Cuanza Sul province in May 2023. ‘It’s always special when you see something like that,’ says Gardiner, head of applied research at the South African Wildlife College. ‘It’s so much more vivid than you can get in a picture.’

Described recently in the journal *Zootaxa*,(see below) Francis’s gorgeous sapphire is now one of 13 unique butterflies known only from this region. Its caterpillars feed on the leaves of *Phragmanthera* mistletoes and mimic the hairy buds growing on the stems. Francis had collected two caterpillars of the butterfly in the Namba Mountains during an earlier trip in October 2022. He reared them back home in Zimbabwe, feeding them on the leaves of mistletoe plants he had cultivated in his Harare garden years earlier. ‘If I didn’t have the [mistletoe] leaves, I would have lost them.’ The butterflies that emerged were both females, with distinctive undersides bearing an extra stripe that no other *Iolaus* butterflies have, he says. But without a male, the team could not yet confirm it as a new species.

The following May they returned to Namba. ‘They’re [living] very high up in these hectic, boulder-strewn forests — a lot of precipices and things like that,’ Francis says. ‘It’s not easy [to catch them] at all.’ But they did catch a male and collected two more caterpillars — this time a male and a female. ‘Once we had the male we could do the genitalia [examination] and that kind of clinched it as a [new] species,’ Francis says.

Mistletoes, and therefore the butterflies themselves, are highly vulnerable to fire, which some experts say are becoming more frequent in Namba and penetrating deeper into closed-canopy forest. ‘Fire kills mistletoe plants, even if their host trees survive,’ Gardiner says.

The loss of mistletoe would ripple through the web of species that depend on it. When sunbirds prod the plants’ flowers for nectar, they explode in their faces, coating them with pollen that they take to other flowers. Fruit eaters, like western tinkerbirds (*Pogoniulus coryphaeus*), later spread the mistletoe’s sticky seeds by wiping them off their beaks onto tree branches. ‘That’s why you want to protect the whole system,’ Gardiner says, ‘because nothing’s in isolation.’

Namba’s Afromontane forest patches, covering only around 590 hectares (1,460 acres), are the largest remnants of this ecosystem in Angola, but remain vulnerable not only to fire, but to agriculture, firewood collection and timber harvesting. ‘There’s undoubtedly stuff yet to be found and described in Namba,’ Gardiner adds. ‘Whether we find it in time or not is the question.’
A separate 2022 expedition by a group of scientists discovered up to 10 probable new species in Namba’s forests, including toads, dragonflies, bats and rodents. Among its unique birdlife are species — like the naked-faced barbet (*Gymnobucco calvus vernayi*), orange ground thrush (*Geokichla gurneyi*) and Laura’s woodland warbler (*Phylloscopus laurae*) — that are now rare or missing in Mount Moco’s forests.

In July, the Angolan cabinet forwarded draft legislation to lawmakers that aims to establish a protected area around Mount Moco, which holds less than 85 hectares (210 acres) of remnant Afromontane patches. But the Namba Mountains, with their larger share of threatened forest, remain unprotected. This could change. Martim Melo, a research associate at the University of Cape Town’s FitzPatrick Institute of African Ornithology who took part in the 2022 expedition that found 10 probable new species in Namba, says he and colleagues presented their findings soon afterward to the director of Angola’s National Institute of Biodiversity Conservation, urging the authorities to create a protected area with community participation. ‘The director took note of the importance of the area and the urgency of granting official protection to these unique, but very fragile, forests,’ Melo tells Mongabay. ‘We are now looking for funds to put together a team to carry out the extensive technical work required to guide the implementation of a future protected area in Namba.’

Costa maintains that unsustainable farming and timber harvesting are currently the biggest threats to Namba’s forests. Once forest clearance or timber extraction begins, it escalates quickly, he says. Sometimes the farmers who clear forests on slopes along the escarpment are newcomers dismissive of traditional, sustainable farming systems, over whom village leaders have little control.

Ryan Truscott, 3 Sep 2025

The best national costume at Bb. Pilipinas 2025 is inspired by the world’s biggest flower.

The Antique-born beauty queen stepped out on stage in a grand garment by Al Manases Villar Alcoran. The sleeveless dress and headpiece were fashioned after bunches of the rafflesia flower, a plant endemic to the country. Each ruby-hued petal was bejewelled in rhinestones, with ant-shaped appliques detailing the headpiece. Dubbed the ‘Diosa Speciosa’, the garment was an homage to Antique's natural resources, which include the world's most colossal flower. ‘The true spectacle unfolds with the cascading train, a dramatic flourish where 3D rafflesias burst forth, enhancing both grandeur and grace,’. ‘It evokes the primal, fiery energy of a special goddess—one inextricably bound to the earth, a living embodiment of nature's relentless cycle. She rises from the soil, a testament to raw power and inherent beauty,’ the post continues. Congratulations on the meaningful win, Blessie!

Photo: Facebook/Binibining Pilipinas

Blessie's recognition brings more attention to the richness of our biodiversity. A parasitic plant that holds the record as the largest flower in the world, *Rafflesia* was discovered in the mountains of Sibalom Natural Park in Antique in 2002. Locally, it's named the 'uruy' or 'karay-a.' The plant currently faces threats of endangerment due to 'slash-and-burn agriculture.'

Blessie Villablanca

Did you know that there's a deciduous mistletoe species in the tropical dry forests of Mexico?

Leaf shedding is a very common trait among plant species inhabiting dry ecosystems. However, mistletoes typically retain their leaves year-round, as they rely on leaf transpiration to pull resources from the host's vascular system. Only a few species with a deciduous habit have been described—four species in the Loranthaceae family and all eight species of the Misodendraceae family, which are found in the temperate regions of Eurasia and southern South America.

In the tropical dry forests of western and central Mexico, *Psittacanthus palmeri* (Loranthaceae) is widespread and often parasitizes *Bursera* trees, such as *Bursera fagaroides* (Burseraceae). In our study, we found that both the mistletoe and its host shed their leaves during the dry season. Interestingly, their fruits are very similar in size and color, suggesting they may share the same bird dispersers. We are currently investigating this aspect further.
If you'd like to learn more about the phenophases of these species and their synchronization, you can read our paper here: https://doi.org/10.1016/j.flora.2025.152707, or feel free to reach out and ask for it!

Monica Elisa Queijeiro-Bolaños, July 3, 2025

Participants praise Push-Pull technology's role in boosting crop production

The implementation of Push-Pull technology been playing a significant role in enhancing crop production in Ethiopia, according to participants. Push-pull technology (PPT) is an agronomic package designed to reduce the effects of *Striga* and stemborers on maize and sorghum production.

In her opening remarks at the 'Upscaling the Benefits of Push-Pull Technology for Sustainable Agriculture in East Africa' General Assembly, Yenenesh Egu, the Lead Executive Officer for Agriculture and

Horticulture Extension at the Ministry of Agriculture, described PPT as an important tool for maximizing domestic resources. The assembly was being held in Addis Ababa from September 1-3, 2025. According to the lead executive officer, PPT offers a range of benefits. It protects staple crops like maize and sorghum from pests, including stem borers and parasitic weeds like *Striga.* Additionally, she noted that the technology increases biomass for animal feed, improves soil fertility, reduces erosion, and helps in climate change mitigation. She also stated that PPT has been successfully introduced and adopted in Ethiopia over the past five years and has growing potential for wider application.

The technology promotes the use of natural fertilizers and is especially beneficial for smallholder farmers. Yenenesh mentioned that the International Centre of Insect Physiology and Ecology (ICIPE) and the Institute for Sustainable Development (ISD) first piloted the technology in Ethiopia.
According to her, Ethiopia's extensive maize and sorghum cultivation areas make it an ideal location for introducing PPT. In 2022, Ethiopia cultivated 11.24 million hectares, producing 31.62 million tons of cereals. Of this, maize and sorghum accounted for 4.20 million hectares, or 37 percent of cereal production, yielding 14.62 million tons. She indicated that yields could have been significantly higher if not for crop losses from pests and weeds. She also acknowledged the technical and financial support of local and international partners, including the European Union, for their role in scaling up the technology.

Ghebremedhin Belay, the Director General of the Institute for Sustainable Development, emphasized that Ethiopia's diverse agroecology makes it well-suited for PPT, particularly for the production of maize and sorghum. He added that efforts are underway to expand the technology to other crops as well. Prof. Emily Poppenborg, the Upscale Project Coordinator at the University of Giessen in Germany, explained that the initiative is a part of the European Commission's Horizon 2020 program and for the last five years, it has been active in five East African countries, including Ethiopia. She described PPT as an agroecological strategy with wide-ranging benefits. 'We are seeing very strong results in Ethiopia's cereal systems, particularly in sorghum and maize,' Poppenborg said. 'Farmers have successfully integrated this technology with vegetables and other crops, and the outcomes are extremely promising.' Poppenborg also noted that PPT improves soil fertility, provides effective control against pests and *Striga*, and enhances climate resilience. The technology uses companion plants, such as legumes like *Desmodium* and various grasses, which, when grown with cereals, strengthen the crops' pest resistance and improve soil health. Scaling up PPT across Ethiopia has the potential to significantly increase yields, strengthen food security, and build resilience against climate change, she added.

Addis Ababa, September 1, 2025 (ENA)

Rare parasitic plant found in Rangitīkei

The discovery of a rare endemic plant in Rangitīkei has delighted the Horizons Regional Council's biodiversity teams. Commonly known as pua o te reinga or wood rose, the parasitic flowering plant *Dactylanthus taylorii* (Mystropetalaceae) is found around the North Island's central plateau.

The tuber of *Dactylanthus taylorii,* with moss covering. Photo Zoë Stone.


(Added) Male and female flowers of *D. taylorii*. Photo David Mudge and Nga Manu

Council senior biodiversity adviser Zoë Stone said she did not expect to find a healthy population so far south. The plant invades the roots of its host species and forms rhizomes to get nutrients from its host. The name wood rose refers to the unique flower-like formation that the host plant forms when *Dactylanthus* attaches to its roots. The two main threats to the plant are the presence of possums and potential absence of short-tailed bats or pekapeka. ‘Possums are attracted to the sweet-smelling blooms causing damage to the plant and interrupting its ability to set seed,’ Stone said.
The plant depended on pekapeka as its main pollinator. Stone said teams would be searching for pekapeka on the property. If they did not find them, the rare plants might need to be pollinated by hand.

The site where the wood rose was found contained a rare fragment of critically endangered rimu, mataī and hīnau forest. Stone said the landowners were thrilled to hear about the discovery and were motivated to work with Horizons to protect them. Old man’s beard and possum control programmes were already under way on the property to support forest regeneration and improve protection of native birds, reptiles and invertebrates. ‘Finding so many live specimens of *Dactylanthus* is possible evidence that the possum control measures in place are working,’ Stone said.

The next steps to help the plant population would be to place cages around them. This would keep the possums away but allow any bats in the area access to pollinate them.
Horizons’ biodiversity, biosecurity and partnerships manager, Craig Davey, said the council planned to expand possum control operations. It would extend its current network of 210,000 bait stations that cover 1.6 million hectares, providing protection for both primary production and native biodiversity.
Stone said although the discovery of *Dactylanthus* might seem like a small thing, the win was really rewarding.

Manawatū reporter August 11, 2025.

QUESTION - repeated

Dreaming *Striga*!

I posed this question in Haustorium 87 and had no offers of an explanation. Hence, I am repeating it together with relevant pictures which were not included last time.

Perhaps surprisingly, I rarely dream parasitic plants, but a recent dream was remarkably ‘sensible’. I was suggesting to a student that he set up pots with sorghum to demonstrate the differing effects of *Striga hermonthica* and *S*. asiatica on the host, the former causing scorch and wilting, the latter causing yellowing or blotching. I do not recall seeing an explanation of the mechanisms by which these contrasting effects occur.

Typical blotching symptoms caused by *Striga hermonthica.*

Typical scorching symptoms from *Striga asiatica.*

I hope someone can advise us, and I will include the answer in the next issue.

Chris Parker.

THESES

Greenhill, Rachel Sarah Rose . 2023. Understanding the molecular genetic basis of virulence in the parasitic weed, *Striga asiatica*. PhD thesis, University of Sheffield. Supervisors R. Butler, J. Scholes and R. Choudhary.

Parasitic weeds of the genus *Striga* are a major constraint to an efficient and profitable agricultural system in Sub-Saharan Africa, causing up to 100% losses in crop yields which disproportionately affect the poorest subsistence farmers. The mode of action for root parasitic plants such as *Striga* is in penetration of the host root cortex to form a xylem-xylem connection through which water and nutrients can be derived, while evading or suppressing the host immune system. A promising strategy for control of *Striga* spp. is the use of resistant crop varieties, but to develop a durable and broad resistance to *Striga* it is also necessary to understand the genetic basis of the parasite's virulence and how virulence can vary between and within populations.

The species *Striga asiatica* is particularly devastating in Madagascar, one of the major rice growing countries in Africa and a major focus for agricultural research. *S. asiatica* is preferentially autogamous, and it is known that naturally selfing species tend to show a greater level of host adaptation to their sympatric hosts. Therefore, gene-for-gene interactions between virulence factors of *S. asiatica* and resistance genes in rice hosts in this evolutionary arms race were considered to be likely. In this study, *S. asiatica* accessions, based on field site location, were sampled across Africa with a focus on Madagascar. Rhizotron-based virulence screens showed that variation in *Striga* virulence was influenced by spatial separation of *S. asiatica* accessions and, to a greater extent, by host variety. However, this variation in virulence did not appear to reflect a race-like structure across the sampled *S. asiatica* accessions, as is seen with the autogamous species, *S. gesnerioides*.

Whole genome resequencing was performed on 47 individuals. Genotyping revealed well defined phylogenetic lineages between countries. Accessions within Madagascar contained multiple selfing lineages suggesting gene flow between sites. Selfing rates across the species within Madagascar were estimated to be at least 95%. A novel genotype-environment association study using redundancy analysis was employed to test associations of 400,000 genic SNPs with virulence phenotypes across rice hosts. A large number of candidate adaptive loci were discovered. Utilising homologous *Arabidopsis* annotations, highly enriched gene ontology terms for *S. asiatica* virulence candidates included several commonly found cell wall degrading enzymes such as pectin acetylesterases and glycosyl hydrolases.

Overall, this thesis has combined phenotypic and genotypic techniques to more clearly characterise the variation in *S. asiatica*. The major findings concluded that virulence is influenced by both spatial and host variety factors, suggesting that in the host-parasite relationship the virulence of *S. asiatica* accessions is not determined in a race-like manner. Whole genome resequencing identified distinct phylogenetic lineages among *S. asiatica* accessions with multiple selfing lineages, and candidate adaptive loci related to virulence, including cell wall degrading enzymes. This study effectively utilised the recent *S. asiatica* reference genome and redundancy analysis as tools for prediction of virulence-associated genes all of which can be built upon for future resistance breeding efforts.

Kaur, Sukhmanpreet. 2025. Exploring host-parasitic plant interactions by examining mechanisms of resistance and susceptibility. PhD, Biological Sciences, Virginia Tech. Supervisors: : Tholl, D.B.C.,, Westwood, J.H., Vinatzer, B.A. Simon, P. Winkel, B. http://hdl.handle.net/10919/133142

Parasitic plants extract water and nutrients from host plants by using specialized structures called haustoria. These interactions can cause 100% crop losses, yet growers lack control options that are effective and affordable. Host crops with resistance to parasitism would be an ideal solution to the problem, but well-characterized examples of host resistance to parasitic plants are limited. This dissertation examines plant responses to parasitic plant infection. It includes studies on resistance mechanisms in carrot (*Daucus* spp.) against two major parasites, the root parasite *Phelipanche aegyptiaca (*Egyptian broomrape) and the shoot parasite *Cuscuta gronovii* (swamp dodder), as well as investigations into *Arabidopsis* and tomato molecular responses to parasitism. These comparative studies reveal parasite-induced changes in hosts across diverse plant systems. The chapter II of the dissertation examines interactions between P. aegyptiaca and wild carrot accessions (*D. glaber, D. littoralis*). Phenotypic and biochemical analyses revealed pre-attachment resistance due to reduced exudation of parasite germination stimulants called strigolactones from roots of the wild carrots. Additional post-attachment resistance was also documented. The chapter III evaluates responses of wild and cultivated carrot (*D. glaber, D. carota* cv. 0493B) to *C. gronovii*. While *D. glaber* was susceptible, carrot cultivar 0493B displayed complete resistance. Histochemical analysis showed that haustoria failed to establish vascular connections in resistant plants and triggered localized pigmentation. Metabolomic profiling indicated parasite-induced shifts in host metabolism. A resistance-associated QTL was mapped to Chromosome 1 (30–50 Mb), and transcriptomic analysis identified four candidate genes, including one potentially involved in lignin biosynthesis. Chapter IV broadens the investigation by characterizing host responses to *P. aegyptiaca* in a well-studied model species, *Arabidopsis thaliana,* and an economically important *P. aegyptiaca* host, *Solanum lycopersicum*. Rather than focusing on resistance, this chapter investigates how susceptible hosts respond to parasitic infection, with a focus on transcriptomic changes in the host during infection. Analyses revealed that both hosts shifted their gene expression related to defense and cell wall metabolism, while species-specific differences were found as well, with tomato inducing hormone signaling, particularly ethylene, more than Arabidopsis in early stages of parasitism. Chapter V again focuses on wild carrots and the biosynthesis of phenylpropenes, a group of secondary metabolites, which serve as natural defense compounds and have pharmaceutical and industrial applications. Tissue specific analyses of phenylpropenes and a corresponding differential gene expression analysis were conducted to determine key genes in phenylpropene formation. Gene candidates for cytochromes P450 and O-methyltransferases catalyzing the proposed enzymatic steps in phenylpropene metabolism were identified. These analyses provide a foundation for future investigations of phenylpropene formation in carrots and other plant species. Together, these studies enhance our understanding of resistance in host–parasite interactions and offer genetic and biochemical insights into protecting carrots and other crops to improve crop resilience, agricultural productivity and food security.

Many crop plants are infected by parasitic plants which extract water and nutrients from their host, often resulting in significant crop damage. The control of parasitic plants remains difficult, and effective management strategies are limited. This dissertation addresses this challenge by investigating mechanisms of resistance in carrot (Daucus spp.) to the parasitic plants *Phelipanche aegyptiaca* (Egyptian broomrape) and *Cuscuta gronovii* (swamp dodder), while also examining outcomes of the infections of host plants that are susceptible to parasitic plants such as *Arabidopsis* and tomato. Chapter II of this dissertation investigates wild carrots that are resistant to P. aegyptiaca. These carrots were found to release fewer chemical signals that trigger the parasite to germinate. Even when the parasite successfully germinated and attached to the carrot root, its development was limited, suggesting the presence of additional resistance mechanisms beyond early signalling. Chapter III reports the discovery of a cultivated carrot that shows strong resistance to *C. gronovii.* This cultivar completely blocked the parasite from forming a functional connection to extract water and nutrients, likely due to natural defense compounds. Understanding how susceptible plants respond to parasitic infection is just as important as studying resistance. Chapter IV focuses on how two susceptible hosts, *Arabidopsis* and the economically important *P. aegyptiaca* host, tomato, respond to infection by *P. aegyptiaca*. The results revealed that both host plants exhibited a combination of shared and species-specific responses. Genes related to defense were downregulated in both hosts during later stages of infection.

However, tomato showed an early upregulation of defense-related genes, especially those tied to signaling by the plant hormone ethylene, a response not observed in *Arabidopsis*. These findings highlight the complexity of host responses and suggest that timing and signaling pathways play a critical role in parasite success. The final chapter explores the formation of natural defense chemicals in wild carrots that are known for their insecticidal properties and pharmaceutical and industrial use. Several genes potentially involved in the biosynthesis of these natural compounds were identified, laying the groundwork for future studies to characterize the biosynthesis of these phytochemicals in detail. Altogether, this work reveals a range of resistance strategies in carrot and uncovers how infection alters plant's essential processes in susceptible species. These findings offer valuable tools for improving agricultural productivity and food security.

Southam, Hanno.2025. Edge spread of hemlock dwarf mistletoe and implications for the group retention silvicultural system. MSc, University of British Columbia. Supervisor: Hamelin, R.C.

Retention silvicultural systems, defined by leaving mature trees in patches (group retention) or dispersed arrangements (dispersed retention), are used in ~30% of harvested area in coastal British Columbia (BC) to balance timber and ecological objectives. Silvicultural systems (objective-driven pathways of harvesting, regeneration and tending activities in a stand) affect forest pathogens, which creates complex decisions where foresters match associated impacts (positive and negative) of pathogens and silvicultural systems to management objectives. This study measured infection patterns of hemlock dwarf mistletoe (HDM; Arceuthobium tsugense (Rosend.) G.N. Jones subsp. tsugense), a native hemi-parasitic plant on hemlock (Tsuga heterophylla (Raf.) Sarg.), to infer additional infection from mature tree patches in group retention relative to clearcut systems. Infection patterns were measured at 11 sites in coastal BC along 55 m edges separating mature forest harbouring HDM from a regenerating clearcut (23–45 years old). HDM infection was assessed with a six-class rating (DMR) that ranged from 0 (uninfected)–6 (>50% branches infected). Mature forests (infection source) had high incidence (95%) and variable average DMR (range = 1.4–5.7) and infected basal area (range = 18–106 m^2/ha). Spread into regenerating forests was variable across infection boundary (3–32 m from edge), incidence (range, trees ≤15 m from edge = 0–100%) and average DMR (range, trees ≤15 m from edge = 0–3.0). Model predictions for a median site indicated light and moderate infection severities were most probable

Barminga, Damaris Jerogony. 2025. Comparative transcriptomic profiles of *Striga* resistance mechanisms within hosts and non hosts plant interactions. MSc. Supervisors: A Sylvester and S. Runo
http://localhost/xmlui/handle/123456789/6762

Majority of the staple cereals cultivated in the sub-Saharan Africa are heavily infested by *Striga* spp., causing tremendous economic losses annually. A durable and broad spectrum approach to *Striga* control is via the deployment of resistant varieties. However, there is breakage of this resistance due to the introduction of novel variants of *Striga* necessitating the need to explore non-hosts that are closely related to the parasitic host range. More so, a dual approach to deciphering the virulence strategies employed by *Striga* during host colonization is essential. This study capitalizes on molecular signatures in; (i) post attachment resistance mechanisms in both hosts (rice and pearl millet) and non-host (Brachiaria mulato II) to underscore new *Striga*-resistance mechanisms (ii) comparative transcriptome profile, to unravel genetic factors and effectors during *Striga* infection of rice(IAC_165 and Nipponbarre), pearl millet(29AW and SOSAT) and Brachiaria mulato II genotypes. Mechanisms of *Striga* resistance of rice, pearl millet and brachiaria were determined via rhizotron assays in a completely randomized design with 3 biological replicates. A comparative transcriptome study of host and non-hosts *Striga* interactions using dual stance RNA sequencing was conducted. In the study, rice and pearl millet are the host plants while brachiaria is the non-host. In rice, IAC_165 is the susceptible genotype, while Nipponbarre is the resistant rice genotype. For pearl millet, 29AW is resistant, while SOSAT is susceptible. In order, to understand the enriched processes, gene ontology (GO) enrichment analysis was done on the differentially expressed genes upon *Striga* infection. Prediction of the pathways enriched upon *Striga* infection was performed using Kyoto Encyclopedia of Genes and Genomes (KEGG). Nipponbare and Brachiaria mulato II showed intact seed coats and a mechanical barrier through the sections. A comparison of the transcriptome profiles of the hosts and non-host pointed to the enhanced expression of defense, secondary metabolite and cell wall reinforcement genes. Notably, less gene expression was observed in the brachiaria as the non-host interaction. An in-depth analysis using Self Organizing Maps (SOMs) on the virulence factors during rice

(IAC_165 and Nipponbarre), pearl millet (29AW and SOSAT) and non-host (Brachiaria) interaction exhibited a temporal clustering of genes during the early and late phase of infection as opposed to compatibility status. There was an observation of the induction of genes involved in enzymatic and non-enzymatic cell wall loosening. Weighted gene co-expression network analysis (WGCNA) homed in on cell wall modification processes resulting from interactions with a resistant (Nipponbare) compared to a susceptible (IAC 165) rice cultivar. This section of the study showed strong fortification at the *Striga*-rice cell walls involving *Striga* on the offense and rice as the host on the defense; as a result depicting the variance between a successful or failed parasite invasion. *Striga* activates enzymes that degrade the host cell wall to enable entry; expansins allow cell elongation and pectin methyl esterase inhibitors facilitate rigidity during infection. Susceptibility pointed to an inactivated immune response processes. Host resistance activates immune responses controlled by plant hormones to strengthen the host cell wall via polysaccharides and lignin accumulation. These findings have far-reaching implications to create durable and broad-spectrum resistant genotypes for *Striga* management program in sub-Saharan Africa.

Abrahamsson, Max. Effects of altitude and climate on the efficiency of Push-Pull in sub-Saharan Africa. (in Swedish) Uppsala University. Supervisors: Jonsson, Mattias and Amboka, Grace.
Small-scale farming is a vital livelihood for much of the population in sub-Saharan Africa. However, crop yields are frequently threatened by pests such as *Spodoptera frugiperda* (fall armyworm) and parasitic weeds like *Striga* spp. The push-pull cropping system (PP) has been shown to effectively reduce pest infestations while improving soil health and crop productivity. This study aimed to examine how geographic and climatic factors—particularly altitude, temperature, and precipitation—influence the effectiveness of push-pull farming compared to conventional non-push-pull (NPP) systems in Rwanda, Uganda, and Kenya. Field data and statistical analyses were used to assess the relationship between altitude and the presence of *Striga* seeds in soil, leaf damage from lepidopteran pests, and overall crop yield. Results showed that push-pull fields generally had fewer *Striga* seeds and, in some cases, higher yields—especially in Kenya. However, the outcomes varied significantly between the different countries. The findings suggest that while push-pull farming can be effective, its success is highly context dependent and influenced by local environmental conditions and farming practices.

FUTURE MEETINGS

The 9th International Weed Science Society Congress (after several changes of plan) will be held along with the Weed Science Society of China and the Asian-Pacific Weed Science Society in Nanjing, Taiwan, 19-24 October 2025. The Congress, with the theme 'New Technology Leads the Way of Weed Science', will be held in the International Youth Convention Hotel, Nanjing, China. The Local Organizing Committee headed by Prof. Xiangju Li (Chair) and Sheng Qiang (Co-Chair) is enthusiastic in preparing an excellent program with plenty of science and cultural exchange. https://www.iwss.info/congress-2025.html

5th International Plant Breeding Conference, Antalya, Turkey December 1-5, 2025. www.intpbc.org

18th World Congress on Parasitic Plants will be held in São Sebastião, Brazil, from 31 May to 5 June 2026**.** https://www.parasiticplants.org/

6th International Symposium on broomrape in Sunflower, Novi Sad, Serbia, June 15-18, 2026. https://panacomp.club/symposium/

AVAILABILITY OF HAUSTORIUM

Haustorium is available to members (only) of IPPS, but is also freely available by regular email (twice yearly) to a wider group of non-members signed up to group mailings managed by Chris Parker (chrisparker5@compuserve.com). Please pass this information on to your colleagues/students. They will be very welcome.Compilation files Haustorium 1-48 and Haustorium 49-87 are also available on request from Chris Parker and, to IPPS members on the IPPS website listed below.

GENERAL WEBSITES

For information on the International Parasitic Plant Society, past issues of Haustorium, etc. see: http://www.parasiticplants.org/

For Dan Nickrent's 'The Parasitic Plant Connection' see: http://www.parasiticplants.siu.edu/

For a description of the PROMISE project (Promoting Root Microbes for Integrated *Striga* Eradication), see: https://promise.nioo.knaw.nl/en

For PARASITE - Preparing African Rice Farmers Against Parasitic Weeds in a Changing Environment: see http://www.parasite-project.org/

For the Toothpick Project – see https://www.toothpickproject.org/

For the Annotated Checklist of Host Plants of Orobanchaceae, see: http://www.farmalierganes.com/Flora/Angiospermae/Orobanchaceae/Host_Orobanchaceae_Checklist.htm

For a description and other information about the *Desmodium* technique for *Striga* suppression, see: http://www.push-pull.net/

For information on the work of the African Agricultural Technology Foundation (AATF) on *Striga* control in Kenya, including periodical 'Strides in *Striga* Management' and 'Partnerships' newsletters, see: http://www.aatf-africa.org/

For Access Agriculture (click on cereals for videos on *Striga*) see*:* http://www.accessagriculture.org/

For information on future Mistel in derTumortherapie Symposia see: http://www.mistelsymposium.de/deutsch/-mistelsymposien.aspx

For a compilation of literature on *Viscum album* prepared by Institute Hiscia in Arlesheim, Switzerland, see: http://www.vfk.ch/informationen/literatursuche (in German but can be searched by inserting author name).

For an excellent publication by the Universidade Federal do Rio Grande do Sul on Southern Brazilian Mistletoes (Dettke, G.A. and Waechter, J.L. 2013) see: https://fieldguides.fieldmuseum.org/sites/default/files/rapid-color-guides-pdfs/493.pdf)

For a participatory website cataloguing tools for the identification and localization of fauna and flora, including parasitic plants see: https://nadaba.net/fr

For Phytoimages, a useful source for photos of weeds, including many parasitic species, see: http://www.phytoimages.siu.edu

LITERATURE

Abdel Rahman, A.H., Hassan, M.M., Mohieldeen, Y.E. and Babiker, A.G.T. 2025. Germination inducing activity of cotton *Gossypium hirsutum* L.) genotypes on *Striga hermonthica* (Del.) Benth. International Journal of Plant & Soil Scienc. 37(1): 430-40. (10.9734/ijpss/2025/v37i75589) [Showing that the extracts and exudates from cotton cv. Hamid were superior to Barakat and Barac in stimulating germination of *S. hermonthica.*]

Adan, I.H., Asudi, G.O., Niassy, S., Jalloh, A.A. and Mutua, J.M. 2024. Comparative microbiome diversity in root-nodules of three *Desmodiu*m species used in push-pull cropping system. Frontiers in Microbiology 15: (https://doi.org/10.3389/fmicb.2024.1395811) [Finding no differences between the root microbiomes pf *Desmodium uncinatum, D. intortum* and *D. incanum*]

Akanmu, A.O., Babalola, O.O., Ayangbenro, A.S., Kutu, F.R. and Odhiambo, J.J.O . 2025. Application of bioinoculants in combating *Striga hermonthica* (Del.) Benth infestation in maize. BMC Microbiology 25: 275-285. (https://doi.org/10.1186/s12866-025-04264-1) [63 bacteria isolates screened for influence on *S. hermonathica.* Five were selected for effect on *S. hermonthica* when applied to the soil and B3 (*Enterobacter chengduensis*), NWUAB12 (*Priestia koreensis*), and B7 (*P. megaterium*) displayed the ability to improve maize growth while minimizing *Striga*-induced damage, isolate B3 has the most effective *Striga* suppression potential.]

Alhassan, S. and 8 others. 2025. Participatory rural appraisal to identify farmer-preferred soybean traits in Ghana. West African Journal of Applied Ecology 33(1): [The study revealed that, despite the existence of pod shattering resistant varieties, many farmers still grow pod shattering susceptible varieties because they are high yielding (Salintuya-I), early maturing (Sounpungun), and a trap crop for S*triga gesnerioiders* (Songda).]

Aliverdi, A. and Mansouri, H. 2025. Silicon protection of sugar beet (*Beta vulgaris*) against field dodder (*Cuscuta campestris*): preliminary analysis. Plant-Environment Interactions,6(2): (https://doi.org/10.1002/pei3.70048) [Irrigating or spraying sugar beet with K_2SiO_3 reduced *C. campestris* biomass by 60%–65%, while the reduction ranged from 20% to 35% with Na_2SiO_3.]

Alós, J.F., Clua, A.B., Gallego, P.P.F. and Solanes, J.P.I. 2024. Lectotypifications and taxonomic changes in *Alectra, Boschniakia, Cistanche, Orobanche, Phelipanche* and *Phelypaea* (all Orobanchaceae). Acta Botanica Malacitana,49(6): 175-186. [By studying type specimens from these six genera, 31 names were lectotypified.]

Al-Sheikh, B., Qumsiyeh, M.B. and Hubbieh, A.S. 2024. Noteworthy records of vascular plants from the West Bank, occupied Palestinian territories. Journal of Threatened Taxa, 16(12):.26225-26233. (https://doi.org/10.11609/jott.9258.16.12.26225-26233) [Confirming the presence of *Cistanche violacea*.]

Anderson, B.M., Edlund, M., James, S.A., Lepschi, B.J., Nickrent, D.L., Sultan, A., Tate, J.A. and Petersen, G. 2025. Evolutionary relationships in Santalales inferred using target capture with Angiosperms353, focusing on Australasian Santalaceae sensu lato. Australian Systematic Botany 38(4): (https://doi.org/10.1071/SB24026) [218 nuclear loci by 195 samples from the sandalwood order were sequenced and phylogenetic inferences made. Support for the evolution of two origins of holoparasitism and five origins of aerial parasitism was obtained. This is the largest sampling of genes and taxa for this order to date, and for the most part, it supported previous work showing

phylogenetic relationships among the genera and families.]

Antunović, S., Rašić, S., Lucić, P., Zimmer, D., Lukačević, M., Kunčević, M. and Štefanić, E. 2025. Distribution and virulence of *Orobanche cumana* Wallr. in sunflower weed communities of northeastern Croatia. Journal of Central European Agriculture, 26(2): 335-344. (https://doi.org/https://doi.org/10.5513/JCEA01/26.2.4539) [Recording a trend of increasing occurrence of *O. cumana* from 2017 to 2021, recorded in the whole region.]

Asadulaev, Z.M. and Sadykova, G.A. 2025. Some features of the anatomical structure of the stem of *Juniperus oblonga* M. Bieb. affected by the hemiparasite *Arceuthobium oxycedri* (DC.) M. Bieb. in Dagestan. Contemporary Problems of Ecology 18(1), pp.118-127.

Atera, E.A., Kikuta, M., Bosire, J., Tsuchiya, Y. and Makihara, D. 2025. Factors contributing to the increasing threat of *Striga hermonthica* to farming communities in Western Kenya. International Journal of Agronomy. International Journal of Agronomy: (https://doi.org/10.1155/ioa/1128845) ['Despite decades of research and the availability of numerous control measures, *Striga* infestation continues to expand.' A survey of 174 farms showed 69% of fields still suffered severe *S. hermonthica* infestation and estimated 47% loss in maize yields.]

Atsmon, G., Kizel, F., Eizenberg, H. and Lat, R. 2025. Spectral remote sensing approaches for monitoring broomrape parasitism dynamics. In: Stafford J.V. (ed.) Precision Agriculture '25: pp. 253-262. (https://doi.org/10.1163/9789004725232_031) [Ground-based hyperspectral scanning demonstrated the ability to detect *Orobanche cumana* parasitism on sunflower roots in the early, sub-soil stages of parasite development. Infestation of *Phelipanche* aegyptiaca in carrots could also be detected.]

Atalay, V.E., Özdemir, P. and Uras, M.E., 2025. In-silico characterization of some natural molecules as bioherbicides for the control of the parasitic plant *Cuscuta* species. The Open Medicinal Chemistry Journal: (DOI: 10.2174/0118741045375365250328064702) [Among 86 plant-derived natural herbicide molecules against (unspecified) *Cuscuta* sp., narciclasine, deoxypodophyllotoxin, and 3-hydroxyuridine are recommended for further evaluation as natural herbicides.]

Baasanmunkh, S. and 7 others. 2025. (Characterization of the complete chloroplast genome of *Pedicularis flava* (Orobanchaceae) (in Mongolian?) Turczaninowia, 28(2): 112-120. [Phylogenetic analysis shows that *Pedicularis* species formed a monophyletic clade and *P. flava* was clustered with *P. resupinate.*]

Barea, G., García-Carneros, A.B., Baltazar, L., Coimbra-Melgar, D.C., Zankiz-Salvatierra, M., Zomeno, P. and Molinero-Ruiz, L. 2025. First report of *Orobanche cumana* Wallr.(sunflower broomrape) in South America. Plant Disease: (https://doi.org/10.1094/PDIS-05-25-1012-PDN) [*O. cumana* reported from several sites in Bolivia, some causing major crop loss. They proved to be race E.]

Ben-Natan, D. and Thorogood, C. 2025. A revision of the genus *Cistanche* (Orobanchaceae) in Israel, and considerations for its taxonomic circumscription in the Middle East. PhytoKeys, 260: 213-36. (10.3897/phytokeys.260.158426) [Confirming the presence of *C. tubulosa* and *C. violacea*, report for the first time the occurrence of *C. laxiflora* plus a separate entity refered to as *C. tinctoria*, and describe a new species, *C. mimii*, previously confused with *C. fissa.* All lavishly illustrated with

photos and Chris Thorogood's great drawings. And a detailed key to the species of the region.]

Bhat, M.N., Singh, B., Tabassum, M. and Kumari, S. 2025. A novel species of *Pedicularis* L. from alpine Himalaya, India. Taiwania 70(2): 308–314. [Describing *Pedicularis lolabiensis* from Kashmir. Including a description of features distinguishing it from *P. oliveriana*.]

Bürger M, Soco CF, García MA, Seto Y, Leyva A. 2025. Three *Orobanche* genomes reveal distinct molecular repertoires in species with different host ranges. Plant and Cell Physiology: (https://doi.org/10.1093/pcp/pcaf047) [Comparing the genomes of three *Orobanche* species with different host ranges: *Orobanche minor* (generalist), *O. gracilis* (*Fabaceae*-specific), and *O. hederae* (ivy-specific) revealed putative strigolactone receptor (KAI2d) numbers varied from five in specialists to eleven in the generalist *O. minor,* suggesting diverse molecular strategies across different host ranges.]

Çakir, F., Çiçek, N. and Yücedağ, C. 2025. Impacts of pine mistletoe on the physiological traits and plant nutrients of Anatolian black pine. European Journal of Plant Pathology: (https://doi.org/10.1007/s10658-025-03059-4) [Suggesting that *Viscum album* subsp. a*ustriacum* caused a notable decline in photosynthetic efficiency and nutrient absorption in *Pinus nigra*inding, affecting plant health.]

Ceccantini, G., do Amaral, M.M. and Teixeira-Costa, L. 2025. Plant life without leaves, roots or stems: anatomy, development and three-dimensional structure of the endoparasite *Pilostyles blanchetii* (Apodanthaceae) in *Mimosa* hosts. Annals of Botany: (https://doi.org/10.1093/aob/mcaf127) [A detailed description of the structure and development of *P. blanchetii* in the bark of *Mimosa* hosts.]

Cerda-Herrera, J.D. and 120 others. 2025. Chromosome level assembly and annotation of *Cuscuta campestris* Yunck. ('field dodder'), a model parasitic plant. G3: Genes, Genomes, Genetics: (https://doi.org/10.1093/g3journal/jkaf193) [Presenting the first chromosome-level genome assembly and annotation for the genus *Cuscuta*. In *C. campestris*, the 505 Mb (1C) genome is assembled into 31 chromosomes and supports annotation of 47,199 protein-coding genes, 214 small RNA loci (including 146 haustoria-specific miRNAs), and 3,238 interspecies mobile mRNA loci. *C. campestris* is a recent tetraploid with a high retention of duplicated genes and chromosomes, and less than 8% nucleotide divergence between homologous chromosomes.]

Ceriotti, L.F., Gatica Soria, L.M., Guzman, .S., Sato, H.A., Tovar Luque, E., Gonzalez, M.A. and Sanchez-Puerta, M.V. 2025. The evolution of the plastid genomes in the holoparasitic Balanophoraceae. Proceedings of the Royal Society B, Biological Sciences 292: (https://doi.org/10.1098/rspb.2024.2011). [This, the most complete analysis of plastomes in the family to date, uses existing and newly generated sequences for 10 genera. Reduced plastome size and GC content, loss of the quadripartite structure, and presence/absence of trnE that have been previously documented are discussed.]

Chavez, D., Nénger, N., Bolaños-Carriel, C., Espinosa Marín, J., Bastidas, W., and García, L. 2025. Ecological modelling of the potential distribution of the mistletoe *Phoradendron nervosum* (Viscaceae) parasitism in Ecuador. *Agriculture 15*(16): (https://doi.org/10.3390/agriculture15161732) [A maximum entropy (MaxEnt version 3.4.4) model was developed which good predictive performance for identifying areas with high suitability for *P. nervosum*, particularly in habitats with adequate water availability and thermal stability. Findings suggest that this mistletoe parasitizes both native and exotic tree species, potentially impacting biodiversity and forest health.]

Che, Y., Zhang, C., Xing, J., Xi, Q., Shao, Y., Zhao, L., Guo, S. and Zuo, Y. 2025. Machine learning-based identification of resistance genes associated with sunflower broomrape. Plant Methods, 21(1): 62. (https://doi.org/10.1186/s13007-025-01383-8) [The least absolute shrinkage and selection operator (LASSO) regression and random forest feature importance ranking method were used along with Support Vector Machine (SVM)to identify 24 resistance genes which effectively distinguished between resistant and susceptible varieties. They also showed a correlation with jasmonic acid.]

Choi, M.S. and Hahn, Y., 2025. Expanding the diversity of *Celavirus*, the most divergent genus in the family Potyviridae. Virus Genes, pp.1-5. [Incidentally referring to *'Striga*-associated poty-like virus 2 (SaPlV2)'.]

Claude, S.J., Kamra, K., Jung, J., Kim, H.O. and Kim, J.H. 2025. Elucidating the evolutionary dynamics of parasitism in *Cuscuta*: in-depth phylogenetic reconstruction and extensive plastomes reduction. BMC genomics 26: (https://doi.org/10.1186/s12864-025-11324-3) [Confirming substantial genomic reductions reflecting the loss of photosynthetic functions and associated genes.]

Cohen, J.I. 2025. Phylogenomics of Boraginaceae and Boraginales using lineage-specific and angiosperms353 loci. Systematic Botany, 49(4): 749-767. (https://doi.org/10.1600/036364424X17323182682762) [This analysis of many taxa and nuclear genes adds yet another twist to the Lennoaceae saga. Early work (Gottschling et al. 2014) showed Lennoaceae to be a component of Ehretiaceae. Luebert et al. (2016), using molecular and morphological data, showed Lennoaceae to be sister to Ehretiaceae. The current study shows Lennoaceae to be sister to *Bourreria*, thus included in Ehretiaceae. Is this the final word? See Vasile et al. (2025) below.]

Cohen, R.O., Cisse, A., Jones, J.U., Williams, J.H. and Eaton, D.A. 2025. Phylogeny does not predict the outcome of heterospecific pollen–pistil interactions in a species-rich alpine plant community. American Journal of Botany 112(3): (https://doi.org/10.1002/ajb2.70004) [Showing that heterospecific pollen transfer between different species of *Pedicularis* does not affect pollen success.]

Damaris, B., Sylvia, M., Willy, K., Brett, H., Sylvester, A., Asela, W. and Steven, R. 2025. Cell wall dynamics in the parasitic plant (*Striga*) and rice pathosystem. MPMI 38(2):285-296. (https://doi.org/10.1094/MPMI-06-24-0064-FI) [In the susceptible host, immune response processes are not induced, and *S. hermonthica*-derived cell wall-degrading enzymes easily breach the host cell wall, resulting in successful parasitism. In contrast, the resistant host invokes immune responses modulated by phytohormones to fortify the cell wall through polysaccharides and lignin deposition.]

Dastjerdi, M.A.B., Yousefi, A.R., Jamshidi, K., Jamshidi, K., Pouryousef, M and Amanifar, S.2025. Inoculation with *Talaromyces trachyspermus* and arbuscular mycorrhizal fungus alongside sulfonylurea herbicides alters *Orobanche aegyptiaca* and tomato growth. Scientific Reports 15: (https://doi.org/10.1038/s41598-025-10177-w) [Demonstrating the effectiveness of rimsulfuron and sulfosulfuron for the control of *O aegyptiaca* in tomato, whether applied by herbigation, or foliar spraying, and the possible enhancement of effectiveness by inoculation with *T. trachyspermus*.]

Degebasa, L., Tessema, T., Bekeko, Z. and Belete, K. 2025. Effect of legume intercropping on infestation of *Striga hermonthica* and productivity of sorghum at Babile District, Oromia Reginal State, Ethiopia. Journal of Crop Health 77(5): (https://doi.org/10.1007/s10343-025-01212-x) [Concluding that intercropping sorghum with common bean , cowpea or soybean reduced *Striga* infestation and increased grain yield.]

Dickoré, B., Kendirbaeva, A., Kasperek, G. and Freitag, H., 2025. *Neottia ovata* (L.) Hartm. (Orchidaceae) new for Kyrgyzstan and a review of its distribution in Middle Asia. Journal of Asia-Pacific Biodiversity 18(1):483-489. (https://doi.org/10.1016/j.japb.2025.02.002)

Eltayeb, A.H., Hassan, M.M., Mohieldeen, Y.E. and Babiker, G.T. 2025. Susceptibility of Sudanese wheat cultivars to *Striga hermonthica* (Del.) Benth. Journal of Experimental Agriculture International 47(7): 313-323.

Eltayeb, A.H.,Yukihiro Sugimoto, Hassan, M.M., Mohieldeen, Y.E. and Babiker, A.G.T. 2025. Purification and characterization of germination stimulants from *Sesamum indicum* L. and their activity on *Striga hermonthica* (Del.) Benth. Journal of Experimental Agriculture International 47(7): 263-276: (DOI:10.9734/jeai/2025/v47i73566) [Exudates from *S. indicum* stimulate germination of *S. hermonthica* but reduce radicle extension. The active ingredient of the exudation appears not to be a strigolactone.]

Fang-Mei, H., Ching-Huang, L. and Lin, T-P. 2025. New addition and a review of *Neotti*a in Taiwan. Taiwania 70(1): 31. [*Neottia ruisuiensis* T.P. Lin., is described and illustrated. A brief taxonomical review of all other species, and a dichotomous key for *Neotti*a in Taiwan is presented.]

Fatino, M., Galaz, J.C., and Hanson, B.D. 2025. Evaluating the safety and efficacy of chemigation alternatives for branched broomrape (*Phelipanche ramosa*) control in processing tomatoes. HortScience, 60(7): 1058–1064. (https://doi.org/10.21273/HORTSCI18497-25) [Noting that the Israeli-commendation of imazapic for the control of *P. ramosa* in tomatoes is unlikely to be registered in California. However, 3 applications of chemigated rimsulfuron alone or paired with pre-plant incorporated sulfosulfuron reduced broomrape emergence and did not injure tomatoes. A 24(c) Special Local Needs label was approved in 2023 that allowed chemigated rimsulfuron in California tomatoes.]

Fengdan, G. and 13 others. 2025. Integrated hormone and transcriptome analyses reveal the mechanisms underlying growth and development changes of *Tamarix chinensis* parasitized by *Cistanche tubulosa.* Industrial Crops and Products 230: (https://doi.org/10.1016/j.indcrop.2025.121109) [Finding that *C. tubulosa* parasitism affects root growth and flowering of *T. chinensis*. Zeatin-type cytokinins from *C. tubulosa* promote host root thickening. Hormones and flowering factors synergistically inhibit flowering of the host.]

García-Carneros, A., Hornero, A., Madrid, F., Zarco-Tejada, P.J. and Molinero-Ruiz, L. 2025. Reaction of sunflower material from IFVCNS to *Orobanche cumana* race F and a sensor-based initial approach for early detection of infections. In: CROPINNO Final Conference 'New Approaches in Crop Improvement for Increased Climate Resilience.': (http://hdl.handle.net/10261/397842) [The most effective devices for detection of *O*. cumana infestation in sunflower were those measuring chlorophyll fluorescence, leaf temperature, stomatal conductance, NDVI, and anthocyanin content. Infected plants also exhibited higher hyperspectral signature values.]

Garg, A. 2025. *Pedicularis rajeshiana* (Orobanchaceae), a new hemiparasitic species from Western Himalaya, India. Phytotaxa 702(2): 149-165. (10.11646/phytotaxa.702.2.3) [Describing *Pedicularis rajeshiana*, most closely related to *P. porrecta* and *P. heydei.*]

Garg, A. 2025. Disjunct distribution and new record of *Euphrasia bhut*anica Pugsley (Orobanchaceae) in Western Himalayas, India. Journal of Palaeosciences 74(1): 19-26. (https://doi.org/10.54991/jop.2025.1899)

Gatica-Soria, L.M., Roulet, M.E., Tulle, W.D., Sato, H.A., Barrandeguy, M.E., and Sanchez-Puerta, M.V. 2025. Highly variable mitochondrial chromosome content in a holoparasitic plant due to recurrent gains of foreign circular DNA. Physiologia Plantarum 177: (10.1111/ppl.70231) Unlike other Balanophoraceae, the mitochondrial genome of *Lophophytum* is highly enriched with foreign DNA from its mimosoid legume hosts, thus generating high intraspecific variability.]

Gray, E.R., Russell, M.B. and Windmuller-Campione, M.A. 2025. The role of eastern spruce dwarf mistletoe in stand dynamics of lowland black spruce forests in Minnesota, USA. Canadian Journal of Forest Research 55: 1-10. (https://doi.org/10.1139/cjfr-2024-024) [Showing that where *Arceuthobium pusillum* causes serious damage to *Pinus mariana* on peatland, species richness was increased.]

Gressel, J. 2025. Has the *Striga* problem been solved? A field perspective critique of recent progress. Pest Management Science: (DOI: 10.1002/ps.70284) [see ESSAY above.]

Hatt, S.A., Grace, O.M., Zuntini, A.R., Cameron, D.D. and Thorogood, C. 2025. Parasitic plants show striking convergence in host preference across angiosperm lineages. Annals of Botany, 135(6): 1135–1146. (https://doi.org/10.1093/aob/mcae180) [Noting the preponderance of Asteraceae, Euphorbiaceae and Fabaceae as hosts of a wide range of parasitic plant families, hinting a common pathway in the evolution of parasitism of eudicots in preference to monocots, which might, in turn, have been driven by a divergence in host root and vascular architecture]

Hatt, S.A., Tsiftsis, S. and Thorogood, C.J. 2024. A taxonomic monograph of the Eurasian holoparasitic plant genus *Lathraea* L.(Orobanchaceae). Phytotaxa, 672(1): 1-29. (10.11646/phytotaxa.672.1.1) [A long-overdue study of the *Lathraea* genus, providing detailed descriptions for just 5 species, along with full synonymy, distribution maps, and notes on habitat, host specificity, phenology, ecology, ethnobotany and threat risk. A key to species is provided along with photographs of living and dried material.]

Holiachuk, Y. and Kosylovych , H. 2025. Spread of quarantine weeds in Ukraine. Quarantine and Plant Protection. 2025(2): 38-44. (https://doi.org/10.36495/2312-0614.2025.2.38-44) [Recording increasing spread of *Cuscuta campestris, C. lehmanniaria* and *C. lupuliformis* in Ukraine.]

Homma, M., Abe, R., Uchida, K., Wakabayashi, T., Okazawa, A., Mizutani, M., Takikawa, H. and Sugimoto, Y. 2025. Tandem gene duplication drives the molecular evolution of orobanchol into a novel non-canonical strigolactone with weak germination-inducing activity toward root parasitic weeds in cowpea. Plant and Cell Physiology: (https://doi.org/10.1093/pcp/pcaf048)

Hood, K.W., Fabbro, F. and Karp, D.S. 2025. Mistletoe-bearing trees positively influence bird foraging patterns across urban and natural environments. Urban Ecosystems 28(3):

(https://doi.org/10.1007/s11252-025-01714-6) [A study in California reinforcing the idea that mistletoes such as *Phoradendron leucarpum* ssp. *macrophyllum* are important for native birds feeding on berries and nectar and may also be important for invertebrate-gleaning birds.]

Hosseini, P., Swett, C.L. and Hanson, B.D. 2025. Addressing challenges of field equipment sanitation to reduce the spread of branched broomrape (*Phelipanche ramosa*) seed among California processing tomato fields. Weed Science, 73(1): (https://doi.org/10.1017/wsc.2025.10028) (The study demonstrates that while quaternary ammonia compound sanitizers can reduce *P. ramosa* seed germinability, their efficacy is compromised in the presence of debris. Therefore, physical cleaning to reduce debris loads before application is essential for reducing the risk of *P. ramosa* seed movement among fields on equipment.]

Hu, X. and 10 others. 2025. 6-hydroxynicotinic acid from *Cucumis melo* inhibits prehaustorium formation in *Phelipanche aegyptiaca* via disruption of auxin signalling pathway. Molecular Plant Pathology 26(8): (https://doi.org/10.1111/mpp.70137)

Huang, Z. and Qi, F. 2025. Engineering strigolactone signaling: toward crops that resist parasites without sacrificing symbiosis. Crop Health, 3(1): (https://doi.org/10.1007/s44297-025-00053-4)

Irafasha, G. *et al.* 2025. Transcriptome atlas of *Striga* germination: implications for managing an intractable parasitic plant. Plants People Planet 7: 396–410.

Jamil, M. and 10 others. 2025. Evaluation of formulated strigolactone analogs for *Striga* management in Kenyan agriculture. Journal of Agriculture and Food Research 21: (https://doi.org/10.1016/j.jafr.2025.101921) [Assessing the activity of strigolactone analogues, MP3 and Nijmegen-1 In lab, pot and field tests and recording up 80% reductions in emergence of *S. hermonthica* in maize. If only they could be commercialised!]

Jatto, M.I. and 8 others. 2025. Combining ability estimates for *Striga* resistance in maize (*Zea mays* L.): a full diallel analysis. Pertanika Journal: Tropical Agricultural Science 48(5): 1591-1613. [A study of crosses from 3 inbred maize parents and four open-pollinated varieties identified several resistant hybrids with low *S. hermonthca* count and damage. The study indicated the importance of additive and non-additive gene actions and maternal gene effect.]

Jiao Xi and 7 others. 2025. Soil inoculated with *Streptomyces rochei* D74 invokes the defense mechanism of *Helianthus annuus* against *Orobanche cumana*. Agriculture 15(14): (https://doi.org/10.3390/agriculture15141492) [Showing that *S. rochei* D74 not only invoked the sunflower systemic resistance (SAR and ISR) by increasing the activity of resistance-related enzymes, the gene expression of systemic resistance marker gene, ethylene synthesis genes and JA synthesis genes. It also formed a protective layer on the sunflower root surface, preventing *O. cumana* from connecting to the vascular system and also reduced *O. cumana* germination.]

Katagiri, S., Fukuhara, D., Fujiyama, K., Fujioka, H., Sugimoto, Y. and Okamoto, M. 2025. Evolutionary and functional significance of ShPP2C1 in the parasitic life strategy of *Striga*. Journal of Experimental Botany: (https://doi.org/10.1093/jxb/eraf412) [The protein phosphatase 2C (ShPP2C1) is a negative regulator of ABA signalling but, unlike typical PP2Cs, is not inhibited by ABA receptors. Because of ShPP2C1, *S. hermonthica* shows low ABA sensitivity and high transpiration, facilitating resource uptake from the host.]

Kawada, K. and 9 others. 2025. Optimization of the KK5 Scaffold and biological evaluation of KK5 derivatives to identify potent strigolactone biosynthesis inhibitors. Journal of Agricultural and Food Chemistry 73(24): (https://doi.org/10.1021/acs.jafc.5c01991) [Showing that 4-(2-phenoxyethoxy)-1-phenyl-3-(1*H*-1,2,4-triazol-1-yl)butanone (KeIKK5) inhibited 4-deoxyorobanchol biosynthesis in rice more potently than KK5 and is thus a potent SL biosynthesis inhibitor]

Kenaley, S.C. and Mathiasen, R.L. 2025. Dwarf mistletoes (*Arceuthobium*, Viscaceae) of North America: classification systems, phylogenetic relationships, and taxonomic characteristics. Plants, 14(13): (https://doi.org/10.3390/plants14132051) [Providing an updated phylogenetic and taxonomic data for 44 taxa of *Arceuthobium* indigenous to N. America addressing knowledge gaps and suggesting future research to improve our understanding of these ecologically and economically important forest tree parasites.]

Khablak, S.H., Bondareva, L.M., Dolia, M.M., Blume, Y.B., Tymoshchuk, T.M., Mrynskyi, I.M., Hrytsiuk, N.V. and Spychak, V.M. 2025. Resistance of new sunflower hybrids to sunflower broomrape (*Orobanche cumana*) and the possibility of their use in the strategy of protection against the parasite. Regulatory Mechanisms in Biosystems 16(2): (https://doi.org/10.15421/0225063) [Noting that *O. cumana* is actively spreading from the northern steppe of Ukraine to the country's central, northern, and western regions. Sunflower hybrids ES Nirvana, ES Romantic, ES Genesis, ES Bella, ES Andromeda, Janis, ES Niagara, and ES Artik, which are tolerant to race G, showed some parasitic effects from broomrape, though the degree of damage was not severe. No hybrids resist race H. Further noting that the widespread accumulation of parasite races E, F, G, and H in sunflower crops is connected to the disruption of crop rotations and the excessive cultivation of hybrids primarily resistant to races 5 (E) and 6 (F) of the parasite.]

Kim, W., Schmidt, N., Jost, M., Mkala, E.M., Winkler, S., Hu, G., Heitkam, T., Wanke, S. 2025. Diverging repeatomes in holoparasitic Hydnoraceae uncover a playground of genome evolution. New Phytologist 247:1520-1537. [The *Hydnora* genomes are dominated by long terminal repeat retrotransposons, while the *Prosopanche* genomes vary greatly in their repeat composition.]

Kobierski, P., Piotrowski, R. and Ryś, R. 2024. Floristic notes from the southwestern part of the Lubuskie Province. Part 2. Fragmenta Floristica et Geobotanica Polonica 29(2): 111-146. (https://doi.org/10.35535/ffgp-2024-0011) [Recording *Melampyrum cristatum* and *Pedicularis sylvatica* in western Poland.]

Kosachev, P.A. and Bolbotov, G.A. 2025. (Two new species of *Pedicularis* (Orobanchaceae) from Eastern Kazakhstan.) (in Russian) Turczaninowia 28(1): (10.14258/turczaninowia.28.1.17) [Describing new species *Pedicularis kotuchovii* and *Pedicularis saurica*, most closely related to *P. venusta* and *P. kaufmannii*. Includes a key.]

Koura, A.A. and 10 others 2025. Multi-traits selection index for selection of cowpea [*Vigna unguiculata* (L.) Walp.]. genotypes for resistance to *Striga gesneroides*. Scholars Academic Journal of Biosciences 13(9): 1351-1362. (https://doi.org/10.36347/sajb.2025.v13i09.006)

Kysylchuk, A. and 21 others. 2025. (Management of cultivation, market analyses, diversification, and changes in herbicide groups of sunflowers in the northeastern region of Ukraine.) (in Ukraianian) (https://dspace.dsau.dp.ua/handle/123456

789/12277)[Reviewing the sales of sunflower seed from 2019 to 2024. Also the sales of herbicide technologies involving Clearfield, ClearfieldPlus and ExpressSun.]

Lee, C.W., Park, H.J., Hwang, J.E., Park, H.B., Kim, Y.J. and Kim, S. 2025. Population size and microhabitat characteristics of the endangered endemic plant *Pedicularis hallaisanensis.* Diversity 17(6): (https://doi.org/10.3390/d17060377) [The findings highlight the importance of maintaining plant diversity and controlling invasive woody species to sustain *P. hallaisanensis* populations.]

Ladd, P.G. and Andrew, M.E. 2025. Reductions in fitness due to an endoparasitic plant are comparable to the impacts of hemiparasites. Australian Journal of Botany 73: (https://doi.org/10.1071/BT24087) [Describing the effects of *Pilostyles hamiltoniorum* on the vegetative growth and reproduction of *Daviesia angulata* in heathland vegetation in Western Australia, which resulted in 50% reduction in flowering, but a significant increase in height.]

Leman, J.K.H., Brun, G., Rohwedder, H.M., and Wicke, S. 2025. Parasitic success of the pathogenic plant *Phelipanche ramosa* (L.) Pomel. (Orobanchaceae) differs in some re-infected versus naïve tomato cultivars. Weed Research 65(2): (https://doi.org/10.1111/wre.12634)

Li, Y., Shen, L., Zhang, W., Duan, Y., Liu, H., Shi, B. and Xu, L. 2025. Genome-wide identification of Auxin Response Factor (ARF) genes and their expression analyses under different biotic and abiotic stresses in *Helianthus annuus* L. International Journal of Biological Macromolecules: (https://doi.org/10.1016/j.ijbiomac.2025.146543) [Studying auxin response factors, transcription factors, in sunflower and concluding that some are up-regulated in resistant sunflower varieties when attacked by *O. cumana*. *HaARF9* and *HaARF39* also contribute to drought response and can thus be used in marker-assisted breeding for the combined resistance.]

Liming Cai, Jansen R.K. and Havird, J.C. 2025. Altered mitochondrial respiration is associated with loss of nuclear-encoded OXPHOS genes in parasitic broomrapes. Ecology and Evolution 15(7) (https://doi.org/10.1002/ece3.71737)

Liu, Rong, Wei-Jia Wang, Hong Wang, Richard H. Ree, De-Zhu Li, and Wen-Bin Yu. 2024. Plant species diversification in the Himalaya–Hengduan Mountains region: an example from an endemic lineage of *Pedicularis* (Orobanchaceae) in the role of floral specializations and rapid range expansions. Cladistics 40(6): 636-652. (Considering the c. 270 endemic species of *Pedicularis* in the Himalaya–Hengduan Mountains region which exhibit high diversity in geographic distribution, elevational range and floral morphology. Results show that the region from northwest Yunnan to southwest Sichuan is the centre of diversity for this clade of *Pedicularis*.]

Lu, Q., Mo, M., Liang, Y., Xu, N., Chen, L., Xu, X. and Jin, Z. 2025. Design and synthesis of strigolactone analogues and mimics containing indolin-2-one scaffold for the *Phelipanche* control. Pest Management Science 81(9): 5510-5523. (https://doi.org/10.1002/ps.8904) [A class of strigolactone mimics incorporating a unique oxime linker has been developed from indolin-2-one, one of which caused high germination of *P. aegyptiaca* and *P. ramosa* and could serve (theoretically!) as a promising lead compound for *Phelipanche* control.]

Mariame, C., Casimir, S.L.A., Ghislain, K., Esther, K.N. and Félix, N.G.T.V. 2025. Control strategies against the infestation of *Striga hermonthica* (Del.) Benth. in millet [*Pennisetum glaucum* (L.) R. Br.] using existing cultural management practices in farmers' fields in Northern Côte D'ivoire. The American Journal of Applied sciences 7(05): 37-50. (https://doi.org/10.37547/tajas/Volume07

Issue05-04) [A study comparing the most effective modes and periods of application of local products such as compost and *Parkia biglobosa* fruit powder against *S. hermonthica*.]

Mariame, C., Casimir, S.L.A. and Roger, N.G.T.V.F. 2025. Producers' perceptions and endogenous strategies for the control of *Striga hermonthica* and impacts of cultural practices on millet (*Pennisetum glaucum* L.) R. Br.) in northern of Côte d'Ivoire. Journal of Animal and Plant Sciences 63(1): 11749 -11763. [The survey revealed farmers' generally good understanding of *S. hermonthica* and the available methods of control including early sowing, spreading *Parkia biglobosa* powder, organo-mineral fertilization, uprooting using false hosts and crop rotation.]

Maslo, S., Šarić, Š., Boškailo, A. and Šarić, E. 2025. Mistletoes (Loranthaceae Juss.) and their preliminary distribution in Bosnia and Herzegovina. Natura Croatica: Periodicum Musei Historiae Naturalis Croatici 34(1): (https://hrcak.srce.hr/331033) [A comprehensive survey detailing the extent and hosts of *Viscum album* ssp. *album* mainly on deciduous trees and shrubs; *V. album* ssp. *abietis* only on *Abies alba*; *V. album* ssp. *austriacum* on *Pinus nigra* and *P. austriacum; Loranthus europeus* on *Castanea sativa* and *Quercus* spp.; and *Arceuthobium* very rarely on *Juniperus* spp.]

Midgley, J.J., Thomson, R.L. and Cramer, M.D. 2025. Mistletoes as indicators of the intensity of browsing by large mammals in Kalahari savanna. African Journal of Ecology 63(6): (https://doi.org/10.1111/aje.70088) [Showing that the occurrence of *Tapinanthus oleifolius* as a parasite on *Ehretia alba* and *Boscia albitrunca* is greatly reduced by the grazing of kudu and giraffe, while it persisted in the spinescent host *Senegalia mellifera*.]

Mitka, J., Kot, M. and Stachurska-Swakoń, A. 2025. Long-term dynamics of a fir-beech forest released from direct human pressure. Forest Ecology and Management 593: (https://doi.org/10.1016/j.foreco.2025.122841) [Following changes in an unmanaged forest over 60 years, during which there was a notable increase in the prevalence of *Viscum alba* subsp. *abietis.*]

Moncalvillo, B., Sandner, T.M. and Matthies, D. 2025. Legumes vary strongly in their quality as hosts for parasitic plants: interactions between the root hemiparasite *Rhinanthus alectorolophus* and 30 legume species. Annals of Botany 135(6): 1147-1164. (https://doi.org/10.1093/aob/mcaf023) [Recording enormous variation in the biomass and other traits of *R. alectorolophus* with 30 different legume species, some proving quite resistant. (no detail in abstract)]

Nenova, N. 2025. Krasela–the first Bulgarian sunflower hybrid, resistant to broomrape (race H) and stable yield potential under limited moisture conditions. Bulgarian Journal of Agricultural Science, 31(2): 367-371. (PDF] agrojournal.org)

Ng, F.S.P. 2025. The reproductive biology of Rafflesiaceae. Journal of Tropical Forest Science 37(2): 131-139. (https://www.jstor.org/stable/48817006) [see LITERATURE HIGHLIGHT above.]

Ng'ong'a, E., Ombok, B., Odhiambo, G. and Aila, F. 2025. Effects of farmers' socio-economic characteristics on adoption of Push Pull Technology in Western Kenya: insights from UPSCALE Project.International Journal. of Extension Education 20(2): 27-32. [A survey revealed that 77% of 304 maize growers practicing Push-Pull technology to control *Striga hermonthica* and ca 60% for crop yield or stem-borer.]

Norsaengsri, M. and 6 others. 2024. A review on subfamily Monotropoideae (Ericaceae) for Thailand: a new genus and species records. Thai Journal of Botany 16(1): 23-33. [Previously only

Hypopitys monotropa (given as *Monotropa hypopitys*) was listed for Thailand. Two new records for the country are reported: *Cheilotheca crocea* and *M. uniflora*.]

Okawa, D. and 10 others. 2025. Functional conservation of the non-canonical strigolactone biosynthetic pathway in root parasitic plants. Plant and Cell Physiology: (https://doi.org/10.1093/pcp/pcaf099) [Showing that the biochemical functions of a number of strigolactone biosynthetic enzymes are conserved in *Orobanche minor* and *Ptheirospermum japanicum* suggesting that these parasitic species can themselves produce strigolactones.]

Okoth, O.C., Willy, K., Okoth, O.R., Mito, D.M. and Steven, R. 2024. Pre-and post-attachment resistance response of popular Western Kenya maize hybrids to parasitism by witchweed (*Striga*). Weed Research 65(2): (https://doi.org/10.1111/wre.12663) [Screening 16 maize hybrids. H614D and H629 exhibited both pre- and post-attachment resistance to *S. hermonthica* comparable to the resistant landrace KSTP'94. DK8031 showed moderate (pre-attachment) resistance, while Duma43, phb30G19 and WH507 showed moderate post-attachment resistance.]

Omoigui, L.O. and 9 others. 2025. Registration of 'UAM15-2157-4'cowpea cultivar combining high yield and market demand traits for the savanna regions of West Africa. Genetic Resources and Crop Evolution: (https://doi.org/10.1007/s10722-025-02601-x) [see Press Report above.]

Ornelas, J.F. and Morales-Saldaña, S. 2025. Secure but flexible: temporary adhesion in mistletoe seedlings. Journal of Experimental Botany, 76(12):.3247-3251. (https://doi.org/10.1093/jxb/eraf205) [Providing detailed comment on the paper by Teixeira-Costa *et al*. (2025) - see below.]

Piazza, C. and Paradis, G. 2025. Further knowledge of *Thesium humile* in the Bonifacio region (Corse-du-Sud) Société botanique d'Occitaine: (https://doi.org/10.34971/VEJ0-XN73) [*T. humile*, rare in Corsica, has disappeared from a limestone valley in the Bonifacio region, but new populations have been found in areas dominated by *Cistus monspeliensis*.]

Pielach, A., Allison, G.G., Leroux, O and Popper, Z.A. 2025. Prehaustoria of root hemiparasites *Rhinanthus minor* and *Odontites vernus* (Orobanchaceae) produce lignin-rich interfacial deposits closely resembling those of attached haustoria, Annals of Botany: (https://doi.org/10.1093/aob/mcaf149)

Piispanen, J., Bergmann, U., Karhu, J., Kauppila, T., Witzell, J. and Kaitera, J. 2025. Temporal and spatial variation in chemical composition of susceptible and resistant alternate hosts of *Cronartium pini, Melampyrum sylvaticum* and *M. pratense*. European Journal of Plant Pathology: (https://doi.org/10.1007/s10658-025-03050-z) [Noting that chlorogenic acid and quercitrin are important factors in the resistance of *M. pratense* to the rust fungus *C. pini*. These compounds are generally lower in the rust-susceptible *M. sylvaticum*, but seasonal variations are also important.]

Pratama, A.C. and 7 others. 2024. Phylogenetic study of several parasitic plant species based on the atp-1 gene sequence. Journal of Smart Bioprospecting and Technology 5(2): 57-63. (https://doi.org/10.21776/ub.jsmartech.2024.005.02.57) (*The atp-1 gene proved that parasitic plants (hemiparasites) are more closely related to non-parasitic plants compared to holoparasite parasitic plants.* The 29 species in the study included *Santalum album, Heisteria parvifolia, Cassytha filiformis and Ombrophytum.]*

Puentes-Marín J, Denison A, Villalba-Alemán J, Mazón-Redín J, Pinto CM. 2025. Analysing the morphological variation of the Galápagos mistletoe *Phoradendron berteroanum* (DC.) Griseb. using herbarium specimens. Biological Journal of the Linnean Society 146(2): (https://doi.org/10.1093/biolinnean/blaf097) [Eight vegetative and floral characters were measured and analyzed for 68 herbarium specimens to assess morphological variation. No evidence of unique island populations was found, thus this taxon represents one species in the Galápagos.]

Quang Li and 7 others. 2025. The invasion of *Cassytha filiformis* accelerated the litter decomposition of native plant communities in small tropical coral islands. BMC Plant Biology 25(1): (https://doi.org/10.1186/s12870-025-06556-0) [The results suggested that the invasion of *C. filiformis* accelerated litter mass loss and element release by regulating litter quality and enzyme activity. However, the short-term rapid litter decomposition may result in nutrient loss, which is not conducive to the growth of native plants.]

Queijeiro-Bolaños, M.E., Ávila-Licona, V. and Cano-Santana, Z. 2025. Differential seed production of two co-infecting dwarf mistletoe species (*Arceuthobium* spp.) parasitizing *Pinus hartwegii*. Forest Science 71: 53–63. (https://doi.org/10.1007/s44391-024-00001-9) [Co-infection significantly affected seed production; *A. globosum* produced more seeds alone, while *A. vaginatum* showed increased seed production in the presence of the other species.]

Queijeiro-Bolaños, M.E., Carrillo-Angeles, M.G., Cervantes-Jiménez, M. and Suzán-Azpiri, H. 2025. Phenology of *Psittacanthus palmeri* (Loranthaceae), a deciduous mistletoe, and its host *Bursera fagaroides.* Flora 326: (https://doi.org/10.1016/j.flora.2025.152707) [*P. palmeri* is a deciduous mistletoe that sheds leaves in the dry season. It flowers in the rainy season, while host. See PRESS REPORTS.]

Rahim, T., Khan, A., Shah, S., Durrani, M., Haider, A., Sultan, A. and Emmanuel, O. 2024. Distribution and conservation significance of endemic and subendemic species of Orobanchaceae, Plantaginaceae and Scrophulariaceae from Pakistan: insights for the nomenclatural updates. Taxonomy and Biosystematics 16(61): 31-54. (10.22108/tbj.2025.144243.1298) [Noting the occurrence of 14 spp. each of *Pedicularis* and *Euphrasia*, 4 species of *Orobanche* and one *Christisonia* species in Pakistan.]

Rätzel, S., Uhlich, H., Raabe, U., Ristow, M., Rother, M. and Kummer, V. 2025. Die Orobanchen (*Orobanche, Phelipanche*) in den Herbarien Albert Dietrich, Teil I: Die in der Flora Regni Borussici behandelten Taxa–*Orobanche buekii*. Kochia 18: 175-239. (https://doi.org/10.21248/kochia.v18.233) [Declaring that *O. buekii* is not a synonym of *O. lutea*. Rather, it belongs to the taxon currently referred to as *O. alsatica*. However, *O. buekii* takes priority over *O. alsatica. Also, O. rubens*/*lutea* var. *buekiana*, widely used an infraspecific taxon of *O. rubens*/*lutea* has proven inapplicable because the basionym *O. buekiana* is synonymous with *O. buekii*. The name *O. lutea* var. *dietrichiana* is introduced for the taxon in question.]

Ren, Q.J., Li, K.H., Wang, H.F., Liu, Y.Y. and Gong, Y.M. 2025. Opposing effects of plant invasion on the stability of aboveground and belowground net primary productivity in an alpine grassland. Ecology and Evolution, 15(7): (https://doi.org/10.1002/ece3.71730) [Relating to the invasion of the parasitic plant *Pedicularis kansuensis*, Invasion decreased above-ground net primary productivity while increasing its recovery and conversely increased below-ground productivity resistance but decreased its recovery.]

Rubio-Rodríguez, E., Moreno-Anzúrez, N.E., Hernández-Santiago, B., Ramos-Valdivia, A.C. and Trejo-Tapia, G. 2025. *Agrobacterium*-mediated transformation for virus-induced gene silencing (VIGS) in *Castilleja tenuiflora*: *Cte-chlH* and *Cte-PDS*. Plant Cell Reporter 44: (https://doi.org/10.1007/s00299-025-03566-y) [Providing a tool to facilitate research on the functions of genes of interest involved in biotechnological processes in *C. tenuiflora*.]

Salamatou, S.S., Maina, F., Soulé, M., Koura, A.A., Mohammed, R., Amadou, H.I. and Yacoubou, B. 2025. Prospection and collection of *Striga hermonthica* ecotypes and cultivated millet in Niger: towards improved control strategies. Journal of Applied Life Sciences International, 28(5): 88-97. ⟨hal-05247713⟩ [Noting that 40-60% of millet fields suffered attack from *S. hermonthica*.]

Samwel, S.W., Kiprotich, K.P. and Ondura, O.J. 2025. Economic benefit analysis of IR maize technology over local landraces in maize production in Western Kenya. Advances in Applied Physiology 10(1): (https://www.sciencepublishinggroup.com/article/10.11648/j.aap.20251001.12) [Field experiments over 2 years confirmed the superiority of imazapyr-resistant variety FR425IR maize in the presence of *Striga hermonthica*, yielding 2.4 t/ha, compared with 1.1 t/ha or less by non-IR hybrids or local landraces.]

Schneider, A.C., Ekwealor, J.T., Besik, A., Ibrahim, N., Ensminger, I. and Stefanović, S. 2025. Photosynthetic activity in the heterotrophic plant genus *Cuscuta* (Convolvulaceae) is modulated by phylogeny and ontogeny. Annals of Botany: (https://doi.org/10.1093/aob/mcaf145) [Providing evidence that photosynthesis in *Cuscuta* is not vestigial but rather modulated based on developmental stage and across phylogenetic history, revealing a dynamic interplay between parasitism and photosynthetic function.]

Shi, L. and 10 others. 2025. The mechanism involved in high-lycopene tomato mutants for broomrape resistance. Agronomy, 15(5): (https://doi.org/10.3390/agronomy15051250) [Investigating the molecular mechanisms of host resistance, focusing on the suppression of strigolactone biosynthesis through altered carotenoid metabolism in the high-pigment tomato mutants hp-1 and og^c apparently due to down-regulation of strigolactone biosynthesis genes leading to enhanced resistance.]

Siti-Munirah, M.Y. and Alias, S.M. 2025. *Thismiaaliasii* (Thismiaceae), a new species from Terengganu, Peninsular Malaysia. PhytoKeys 254: 175-188. (10.3897/phytokeys.254.136085) [*Thismia aliasii* is described and illustrated. Its floral morphology places it in subsection Odoardoa. It is provisionally classified as Critically Endangered.]

Soares, A.C., Romero, F.M., Amaral, S.D., Cruz, Í.V., Lopes, R.B., Costa, J.V. and Rubim, C.L. 2024. Diversity, composition, distribution and similarity of hemiparasites (Loranthaceae and Santalaceae) in the Brazilian Amazon. Revista Sustentabilidade, International Scientific Journal 1(1): 14 pp. [A broad survey noting the Brazilian Amazon region has 107 species of hemiparasites, and detailing their occurrence where *Andira inermis, Ficus benjamina, Terminalia catappa* are the main host species of urban afforestation. *Passovia pedunculata*, the main hemi-parasite of the region, while *Oryctanthus florulentus* and *Psittacanthus acinarius* exclusively infest *Andira inermis*.]

Solikin, S. 2025. Exploring the diversity and infestation of mistletoes in cultivation of Sengon (*Falcataria falcata* (L.) Greuter & R. Rankin) in Malang, East Java, Indonesia. Geography, Earth Science and Environment: Research Highlights 3: 91-110. [*Scurrula atropurpurea* and *Viscum ovalifolium* are the two species of mistletoe fund in the cultivation of the timber tree *Falcataria falcata.*]

Sousa, V.C., de Paula-Soza, J. and Latvis, M. 2025. (3108) Proposal to conserve *Agalinis*, nom. cons. against the additional name *Esterhazya* (Orobanchaceae). Taxon 74(4): 994-995. (https://doi.org/10.1002/tax.70025) [The molecular phylogenetic study by Latvis et al. (2024) showed *Esterhazya* (published 1822) embedded within *Agalinis* (published 1837). To minimize the impact on herbaria and preserve nomenclatural stability, the authors propose conserving the more speciose *Agalinis* over *Esterhazya*.]

Steven, R., Susann, W. and Chris, T. 202. Parasitic plants are models for examining global food security, biodiversity loss and host–parasite evolution, in a changing world. PlantsPeoplePlanet 702(3): 303-307. (https://doi.org/10.1002/ppp3.10616) [Proposing that study of parasitic plants contributes to global food security, conservastion and host-parasite-environment interactions.]

Suetsugu, K. and Okada, H. 2025. High mycorrhizal specificity in the monotypic mycoheterotrophic genus *Relictithismia* (Thismiaceae). Mycorrhiza 35: (https://doi.org/10.1007/s00572-025-01202-x) [Analyses revealed that both *R. kimotsukiensis* and *T. abei* both occurring in S. Japan are predominantly associated with two specific mycorrhiza (VTX00295 and VTX00106) of the genus *Rhizophagus* (Glomeraceae). These mycorrhizae occur widely are widely distributed globally and are thus not responsible for the limited distribution of these Thismiaceae.]

Suetsugu, K. and Okada, H. 2025. Subterranean morphology underpins the degree of mycoheterotrophy, mycorrhizal associations, and plant vigor in a green orchid *Oreorchis patens.* The Plant Journal 121(4): (https://doi.org/10.1111/tpj.700450) [Showing_ that *O. patens* plants with coralloid rhizomes predominantly associate with saprotrophic Psathyrellaceae fungi, demonstrated more vigorous flowering scapes and produced a higher number of flowers, suggesting that mycoheterotrophy significantly enhances plant vigour.]

Teixeira-Costa, L., Wiese, L., Speck, T. and Mylo, M.D. 2025. Starting strong: development and biomechanics of the seedling–host interaction in European mistletoe (*Viscum album*). Journal of Experimental Botany: (https://doi.org/10.1093/jxb/eraf129) [Describing the 3 means by which *V. album* attaches to the host, the seed coat, hypocotyl, and holdfast. The viscin layer, a sticky coating on the seed, provides initial adhesion before the growing hypocotyl expands towards the host surface, where it flattens and forms a holdfast that strengthens adhesion and aids tissue penetration.]

Těšitel, J. and 10 others. 2025. Hemiparasitic plants facilitate ecological restoration of encroached European grasslands. Journal of Environmental Management 374: (https://doi.org/10.1016/j.jenvman.2025.124120) [Showing that *Rhinanthus* spp., in combination with mowing, provides an efficient and widely applicable method to reverse the encroachment of *Calamogrostis epigejos* into grasslands and restore the diversity of infested plant communities.]

Tinoco-Domínguez, E., Amancio, G., Robles-Fernández, Á.L. and Lira-Noriega, A. 2025. Interaction network of *Phoradendron* and its hosts and the influence of phylogenetic, geographic, and environmental factors on the probability of interaction. American Journal of Botany, 112(4): (https://doi.org/10.1002/ajb2.70025) [Concluding that the network of *Phoradendron*–host interactions is highly specialized, and the structure of this network depends mainly on the phylogenetic distance of the hosts.]

Tinoco-Domínguez, E., González-Elizondo, M.S. and Lira-Noriega, A. 2024. American mistletoes: a dataset of *Phoradendron* species and their hosts across their distribution range. Ecology 105(1): (https://doi.org/10.1002/ecy.4394) [A detailed compilation of interactions between *Phoradendron* spp. and their hosts throughout the Americas, providing information on 1159 species and 544 hosts at the species level.]

Tourneur, S., Combier, J.-P., Plaza, S., Muños, S., and Delavault, P. 2025. MicroRNA-encoded peptides inhibit seed germination of the root parasitic plant *Orobanche cumana*. Plants People Planet 7: 436–447. [Through seed germination assays and qRT-PCR analysis the impact of exogenous treatments of synthetic miPEPs on broomrape seed germination was investigated. 11 of the 39 designed miPEPs strongly inhibited seed germination in *O. cumana,* thus providing a possible control method using highly specific and biodegradable natural substances.]

Udandarao, N.J., Yamashita, Y., Ushima, R., Tsuchida, T. and Bessho-Uehara, K. 2025. Parasitic-plant parasite rewires flowering pathways to induce stem-derived galls. Plant Direct, 9(8): (https://doi.org/10.1002/pld3.70099) [In the stem of *Cuscuta campestris*, the weevil *Smicronyx madaranus* forms galls that unexpectedly activate photosynthesis. Apparently the weevil triggers ectopic activation of the flowering pathway in non-floral tissues, potentially redirecting the typical flowering cascade to drive gall formation. Photosynthesis-related genes were highly expressed in later stage of galls, despite the host being a holoparasitic plant. Shading experiments confirmed that photosynthesis is crucial for both gall and the weevil growth.)

Vasile, M-A., Böhnert, T., Jeiter, J., Cardoso, D., Moonlight, D.W. and Weigend, M. 2025. An updated phylogeny of Boraginales based on the Angiosperms353 probe set: a roadmap for understanding morphological evolution. Annals of Botany 136(1): (https://doi.org/10.1093/aob/mcaf061) [Following from the comments on Cohen (2025) above, this phylogenetic study also confirms the position of Lennoaceae within Ehretiaceae with strong support. This paper is noteworthy also in its analysis of gynoecium and fruit morphology in Boraginales.]

Wang, J.Y., Jamil, M., Berqdar, L.M.T., Asami, T. and Al-Babili, S. 2025. Structural substitutions on the methoxybenzene ring retain the biological activity of the zaxinone mimics MiZax3. Frontiers in Plant Science16: (https://doi.org/10.3389/fpls.2025.1631066)

Wang Wen-jun, Li Lian-fang, Hou Hai-xiong, Wu Cheng-peng, Ding Bing and Li Zheng-yin. 2025. Opiliaceae species: a review. (in Chinese) Journal of Southern Agriculture 56(2): 674-682. (10.3969/j.issn.2095-1191.2025.02.031) [Noting the presence of *Yunnanopilia longistaminea*, *Champereia manillana*, *Cansjera rheedei*, *Opilia amentacea*, *Lepionurus sylvestris* and *Urobotrya latisquama* in China, while debating and confirming the evidence for the correct placement of *Y. longistaminata.*]

Wang, X., Feng, B., Li, Y., Yang, Y. and Wei, B. 2025. Projected landscape and habitat dynamics for *Malania oleifera* (Santalales: Olacaceae) under climate change. Biological Journal of the Linnean Society, 145(2): (https://doi.org/10.1093/biolinnean/blaf024) [The study indicates that environmental factors are pivotal to the distribution of *M. oleifera* in China, with climate change posing significant threats to its habitat.]

Wang, Y., Bu, H., Gu, X., Liu, W. and Wang, X. 2025. Integrated omic analysis provides insights into how *Cuscuta australis* inhibits the growth and reproduction of *Xanthium spinosum*. BMC plant biology, 25(1): (https://doi.org/10.1186/s12870-025-06698-1) [*C. australis* reduced the growth potential of *X. spinosum*, including a 92% reduction in seed production. The majority of differentially expressed genes in the galactose metabolism pathway were upregulated, leading to increased sugar accumulation and disrupted metabolism.]

Wei, K., Tang, S., Huang, H., Yan, S., Xing, J. and Li, X. 2025. *Striga asiatica* (L.) O. Kuntze: A systematic review of morphology, traditional uses, phytochemistry, quality control, pharmacology, and modern applications. South African Journal of Botany 179: 160-178. (https://doi.org/10.1016/j.sajb.2025.02.019) [A broad-ranging review with emphasis on phytochemistry and therapeutic uses.]

Wójcik, D., Mikiciński, A., Kowalczys, K. and Sobiczewski, P., 2025. Induction of defence responses in apple trees by treatment with products of natural origin. European Journal of Plant Pathology 172(2), pp.315-327.

Xiaolin, S., Xue, R. and Airong, L. 2025. Soil P availability modulates host selectivity of *Pedicularis kansuensis* between legumes and grasses. Plants 14(15): (https://doi.org/10.3390/plants14152356)

Xin Hu and 10 others. 2025. 6-hydroxynicotinic acid from *Cucumis melo* inhibits prehaustorium formation in *Phelipanche aegyptiaca* via disruption of auxin signalling pathway. Molecular Plant Pathology 26(8): (https://doi.org/10.1111/mpp.70137) [Resistant *C. melo* exudes 6-hydroxynicotinic which is shown to reduce the expression of genes related to auxin signalling and hence prehaustorium formation.]

Xu, T., Xi, J., Wang, Y., Zhang, Y., Ke, J., Wei, X. and Lin, Y. 2025. Bio-organic fertilizer mitigates *Orobanche cumana* parasitism by regulating sunflower transcriptomes and rhizosphere microbial community. Plant and Soil: (https://doi.org/10.1007/s11104-025-07542-z) [Application of bio-organic fertilizer (unspecified in abstract) remolded the rhizosphere microbial structure and significantly increased seed yield and crude protein content of sunflower. *O. cumana* roots exhibited decay-inducing fungal colonization, the isolated strain *Fusarium solani* L5 significantly reducing the number of parasites.]

Yang, J., Shen, G. and Wu, J. 2025. Jasmonic acid and salicylic acid transcriptionally regulate CuRe1 in cultivated tomato to activate resistance to parasitization by dodder *Cuscuta australis*. Plant Diversity 47(3): 511-521. (https://doi.org/10.1016/j.pld.2025.03.003) [Showing that jasmonic acid (JA) and salicylic acid (SA) in cultivated tomato stems were highly induced by *C. australis* parasitization, and proposing a linear model that an unknown receptor perceives *Cuscuta* parasitization and thus triggers accumulation of JA and SA, which in turn induce the transcription of *CuRe1*, and CuRe1 and SOBIR1/SOBIR1-like thereby activate resistance to *Cuscuta*.]

Yokoyama, T., Asaoka, M. and Nishitani, K. 2025. A unique phytochrome B gene in *Cuscuta campestris* and its responses during the initial stage of haustorium formation. Journal of Plant Research: (https://link.springer.com/article/10.1007/s10265-025-01653-5)

Yoshida, S., 2024. Divergent receptors shape strigolactone perception in a facultative parasitic plant. *Plant and Cell Physiology* 65(12) 1904-1906. (https://doi.org/10.1093/pcp/pcae124)

Yu, X., Wu, T., Wang, W.B., Ma, T.Y., Ma, Q.Y., Zhang, J.Y. and Zhang, J.L. 2025. Over-compensation of the native herb Qiai (*Artemisia argyi* var. *argyi* cv. Qiai) to infection with alien field dodder (*Cuscuta campestris*). Journal of Plant Research 138: 575–586.

Yuan, Y., Han, C., Wang, J. and Li, J. 2024. Parasitic plants regulate C and N distribution among common mycorrhizal networks linking host and neighboring plants. Ecology, 105(10): (https://doi.org/10.1002/ecy.4418) [Showing that common mycorrhizal networks distributed more ^{15}N to unparasitized neighboring *T. pratense* than to *T. pratense* parasitised by *Cuscuta gronovii*.. Moreover, the unparasitized neighboring *T. pratense* provides more recently fixed C to the mycorrhiza than the parasitized host *T. pratense*.]

Zhang, D., Liu, H. and Timko, M.P. 2025. Functional characterization of avirulence factors in the haustorial secretome of the parasitic weed *Striga gesnerioides* L. (Walp). Plant Cell Physiology 2025 : (10.1093/pcp/pcaf054) [Comparative transcriptomics identified a set of differentially expressed transcripts in *S. gesneriodes* haustorial secretome during incompatible host-parasite interactions that annotated as candidate avirulence (Avr) factors. A study contrasting the races SG3 and SG4 having contrasting virulence on cowpea variety B.301.]

Zhao, N., Abuduxiti, Z., Lin, Y. and Qiang, S. 2025. First report of *Orobanche aegyptiaca* parasitism on peanut in Southern Xinjiang, China. Plant Disease, 109(5: (https://doi.org/10.1094/PDIS-01-25-0198-PDN)

Zhao, N., Zhong, M., Grey, T.L. and Qiang, S. 2025. Further investigations on the occurrence patterns of multiple broomrape species in Xinjiang China. Crop Protection 197: (https://doi.org/10.1016/j.cropro.2025.107287) [Noting increasing occurrence of *Orobanche cumana* mainly in sunflower but also tomato, while *Phelipanche aegyptiaca* has a wider range in tomato, musk melon, watermelon pumpkin and cucumber. Estimating that climate change may slightly reduce occurrence of *O. cumana* but greatly increase that of *P. aegyptiaca.*]

Zhao, R., Li, L., Xu, R., Bai, R., Bao, A., Qing, H., Yan, F., Lin, X. and Wuriyanghan, H. 2025. The DCD domain-containing protein HaB2 enhances sunflower resistance to *Orobanche cumana* via the ABA signaling pathway. Plant And Cell Physiology: (https://doi.org/10.1093/pcp/pcaf089)

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