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Research Article

Exploring Elicit-AI Powered Literature Research Tool: Insights from a Topic on Digitalization in Insect Science

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Abstract | Elicit is a powerful research assistant tool based on language models like GPT-3, and uses semantic similarity to search articles relevant to a research question among multiple databases. This article evaluates the effectiveness of the Elicit-AI tool in facilitating literature research for the topic of "Digitization in Insect Science." As digital technologies increasingly transform entomological research, the ability to efficiently navigate the growing body of scientific literature is crucial. Elicit-AI, an AI-powered literature research tool, promises to streamline the process of data collection, synthesis, and knowledge extraction. Through a case study focused on digitalization in insect science, I demonstrated how Elicit-AI aids researchers in identifying key trends, summarizing complex research, and uncovering emerging themes. By posing specific queries related to digital technologies in insect study, I assessed the tool's accuracy, relevance, and utility. About 81% of the articles were most relevant to the given keywords, digitalization, and insect science; however, 12% of the articles were related to the latest area in the field of entomology. The results highlight Elicit-AI's ability to quickly locate relevant studies, generate useful insights, and enhance the literature review process. However, challenges such as the need for more nuanced search parameters and refinement of results are also discussed. Ultimately, this study underscores the potential of AI-driven research tools like Elicit-AI to support efficient, high-quality literature reviews, offering new avenues for research in digitization across scientific disciplines.

Novelty Statement | The study highlights the efficiency of Elicit-AI in streamlining the literature review process by accurately retrieving and synthesizing relevant research on a specialized topic.

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Introduction

A literature review is a structured and methodical approach to evaluating and synthesizing existing research on a particular topic. The primary objective is to thoroughly identify and assess all related literature pertaining to a research question, following strict protocols to minimize bias and ensure comprehensive coverage (Higgins, 2011). The number of published papers continues to grow exponentially, and as a result, the resources and time period needed to implement more rigorous methods are also increasing. This makes it increasingly tough for an individual to cover and collect all comprehensive literature, especially for topics that are broader or more established. Only in 2022, approximately 5.14 million articles were published, with the rate of new publications continuing to rise (Curcic, 2023). As a result, multiple reviewers are typically needed when developing evidence syntheses. Even with the involvement of these multiple reviewers, the process remains highly time-consuming,

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and important information can still be unintentionally missed or overlooked because of human error (Haddaway *et al*., 2022).

The AI tools, equipped with access to vast amounts of data, provide real-time, intelligent responses to user queries (De Angelis *et al*., 2023). This contrasts sharply with the time-consuming process of manually searching through published literature to retrieve specific information. Given the exponential increase in scientific publications, finding targeted information manually has become a daunting task. For example, answering a seemingly straightforward and simple question like Which digital technology is being used in insect science? can be a complex and time-intensive endeavor.

Advancing knowledge in this area holds significant promise due to several factors: (1) standalone review projects typically require considerable time and effort, often spanning months or even years (Larsen *et al*., 2019); (2) the number of reviews published in Information Systems (IS) journals has been gradually increasing (Schryen *et al*., 2020); and (3) literature reviews encompass tasks that range from mechanical to creative in nature. However, the process of conducting literature reviews is still largely manual, with sample sizes growing to the point where they risk surpassing the cognitive processing capacity of human researchers.

Artificial intelligence (AI) is a transformative technology that is leading significant advancements across various fields, influencing both technological development and societal progress (Briganti and Le Moine, 2020; Wang *et al*., 2023). Artificial intelligence is rapidly evolving, with new AI tools continuously emerging to simplify tasks that would otherwise be time-consuming and labor-intensive. These advancements are not only transforming various aspects of daily life but are also bringing significant benefits to the field of education. As a result, AI tools are being included in educational processes, improving both teaching and learning experiences. Some AI tools, in particular, are designed to assist academics by supporting tasks such as literature reviews, research analysis, and study evaluations. The use of AI as an academic assistant offers numerous advantages, as highlighted by Gannon (2019), who discusses AI's growing role in eScience, particularly as a daily research aid. Similarly, studies by Czibula *et al*. (2009) and Hsieh and Buehrer (2014) explore the potential benefits of AI systems trained under supervision to develop intelligence capabilities.

The AI-powered research assistant Elicit leverages advanced language models to automate various aspects of the research workflow, particularly in the context of literature reviews. Elicit helps researchers find relevant papers even when the exact keyword match is not present, summarizes key takeaways tailored to specific research questions, and extracts important information from the papers. While the primary focus of Elicit is to answer research questions with relevant studies, the tool also supports other tasks such as brainstorming, summarization, and text classification.

Using models like GPT-3, Elicit automates parts of the research process, enabling researchers to work more efficiently. When a question is posed, Elicit identifies relevant papers and presents summaries of the key information from those papers in an easy-to-read table, streamlining the process of literature review and helping researchers quickly gather the information they need. In the context of this research, content was generated on a specific topic, "Digitalization in Insect Science," using the Elicit-AI tool. These contents were then evaluated based on factors such as source accuracy, content reliability, and relevance of articles. The findings were systematically presented in accordance with the research objectives, and recommendations were provided based on the results of the analysis.

Materials and Methods

Using Elicit-AI for literature search

To explore the role of AI and digital technologies in insect science, I utilized Elicit-AI to conduct a literature review on the topic of "Digitalization in Insect Science." As entomologists, I selected the topic of insects. The primary objective was to assess how Elicit-AI could aid in automating the literature search and synthesis process, as well as to evaluate the relevance and quality of the retrieved research. I began by inputting the core topic, "Digitalization in Insect Science," into the Elicit-AI platform. This allowed the tool to search across a broad range of academic papers, journals, and other relevant sources, with a focus on identifying key trends and developments in the intersection of digital technologies and insect science.

To refine the search, I specified only two key parameters or keywords that aligned with the topic and research objectives. These included: Digitalization and insect science. By using these parameters, I was able to guide Elicit-AI to retrieve studies that addressed both general trends in digitization and specific technological advancements within the field of insect science. By posing these keywords, Elicit-AI was able to narrow down the search results to the most relevant papers, offering insights into the application of digital tools. The output included summaries of the key findings from each article, helping to provide a clear and concise overview of the literature in relation to these key questions (Figure 1).

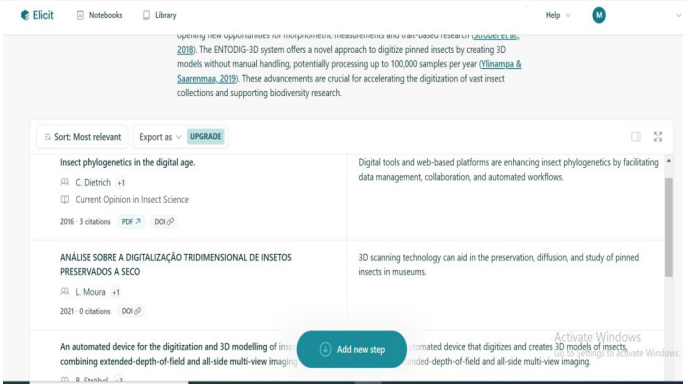

Figure 1: Posing keywords to search literature on a specific topic using Elicit-AI for literature search.

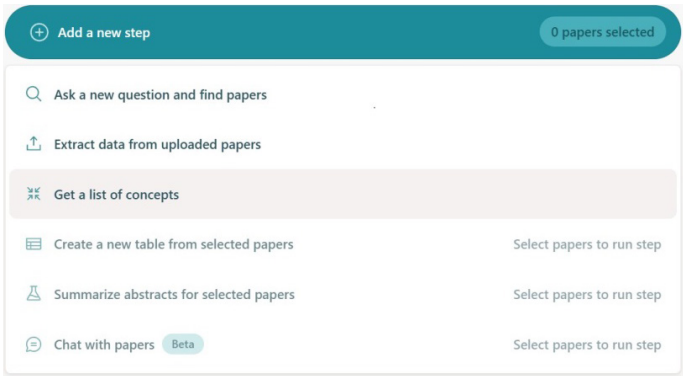

Figure 2: Using Elicit-AI for literature search and different features.

In addition to its powerful capabilities for literature search and synthesis, Elicit-AI provides users with valuable features for data extraction and organization. These features are particularly useful for researchers who need to compile and organize large volumes of information for a systematic review or to conduct in-depth analysis (Figure 2).

Results

Elicit-AI literature search on a specific topic

The Elicit-AI tool returned a total of 99 articles related to the topic of Digitalization in Insect Science. After reviewing the results, several observations were made regarding the relevance, accuracy, and sources of the articles (Figure 3). Out of the 99 articles retrieved by Elicit-AI, 6 articles were not related to insect science and were not included in Table 1. These articles primarily focused on general digital technologies, which, although relevant to the broader field of digitalization, did not address topics specifically related to insect science or entomology. However, Elicit-AI itself flagged these articles as irrelevant, indicating that the tool effectively identified content that was outside the scope of the research topic. This demonstrates the tool's ability to filter out articles that do not meet the specific focus of the query. About 81% of articles were most relevant to the topic covering both keywords, digitalization and insects. About 12% of articles were related to insect science with different aspects but with the latest studies related to the entomology field.

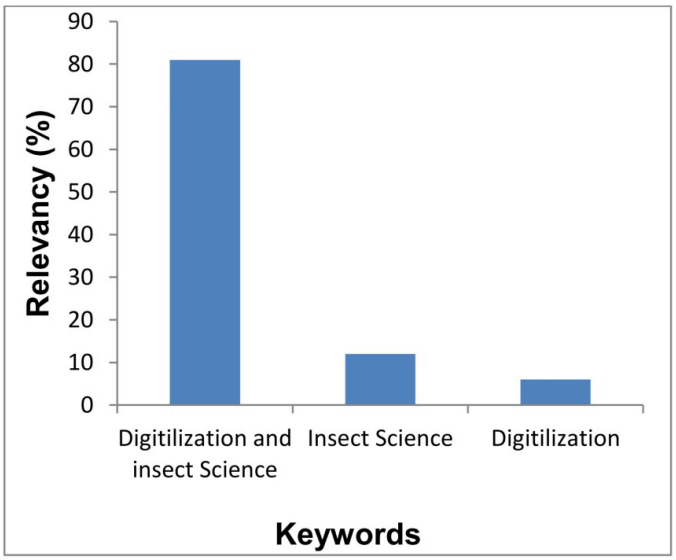

Figure 3: Relevancy (%) of literature search on given keywords using Elicit-AI literature research tool.

Regarding the sources of the articles, 5 sources were missing from the results. These were primarily conference proceedings, which are often not indexed in major databases like Google Scholar or may not be captured as readily in certain journal databases. This limitation is something to keep in mind, as some relevant research may be found in conferences, which are sometimes excluded from large-scale literature reviews if databases are not comprehensive. The remaining articles were from academic journals related to insect science, digital technologies, and AI in research, which helped validate the accuracy of the retrieved content.

To ensure the validity of the information provided by Elicit-AI, I conducted a thorough accuracy check for each article retrieved. This process involved manually verifying the following details: (1) Title of the article, (2) Main author and number of co-authors, (3) Source/journal name, (4) Year of publication, and (5) Summary of each article.

For the majority of the articles, the information provided by Elicit-AI was accurate and consistent with the data available through Google Scholar and other academic databases. The tool accurately matched the titles, authors, and publication years for the articles retrieved. However, one article did not exist in Google Scholar, despite being listed in the results provided by Elicit-AI. This discrepancy could be attributed to a misidentification or an indexing issue with the particular article, which highlights a potential limitation in the tool's search capabilities for certain sources or lesser-known journals. Nevertheless, this was an isolated case and did not significantly impact the overall quality of the results.

Table 1: Elicit AI-powered literature research on digitalization in insect science topic.

Title	Authors	Source	Year	
Biological effects of …….. meta-analysis	Alain Thill +2	Reviews on Environmental Health	2023	http://doi:10.1515/reveh-2023-0072.
Reduced-representation libraries in insect genetics.	K. Hopper	Current Opinion in Insect Science	2023	https://doi.org/10.1016/j.cois.2023.101084
Automatic Description …….. from Digitized Images	Yuanmao Zhou +2	Systematic Zoology	1985	https://doi.org/10.1093/sysbio/34.3.346
BEEtag: A Low-Cost, Image-Based …….. Locomotion	J. Crall +3	bioRxiv	2015	https://doi.org/10.1371/journal.pone.0136487
Recent Advances ……. A Systematic Review	Andr. D. +4	Forests MDPI	2022	https://doi.org/10.3390/f13060911
Advanced Techniques …… (Insecta)	Buffington+2	American Entomologist	2005	https://doi.org/10.1093/ae/51.1.50
Mesoscopic fluorescence …… developing Drosophila.	Claudio Vinegoni +5	Journal of Visualized Experiments	2009	https://doi:10.3791/1510.
Why plant volatile analysis …….. complex profiles.	N. V. van Dam +1	Plant biology	2008	https://doi:10.1055/s-2007-964961.
Elucidating ……. using dMRI	S. Shahid +3	Scientific Reports	2021	https://doi.org/10.1038/s41598-021-82187-3
Adult Drosophila ……. during ageing	Dhananjay Chaturvedi +4	Open Biology	2019	https://doi:10.1098/rsob.190087
Digital Technology ……..: Opportunities and Challenges.	Alexandra L. MacMillan Uribe +5	Journal of nutrition education and behavior	2023	https://doi:10.1016/j.jneb.2023.04.006
Imaging in Systems Biology	Sean Gregory Megason +1	Cell	2007	https://doi:10.1016/j.cell.2007.08.031
Digital image …… with reference to insects	Nikhil U. Joshi +2	Journal of Threatened Taxa	2020	https://DOI:10.11609/jott.5041.12.1.15173-15180
Biological effects ……. review and meta-analysis	Alain Thill +2	Reviews on Environmental Health	2023	https://doi.org/10.1515/reveh-2023-0072
Elucidating the complex …….. using dMRI	S. S. Shahid +3	bioRxiv	2020	https://doi.org/10.1038/s41598-021-82187-3
Methods of Insect Image …….. Literature Review	Don Chathurika Amarathunga, +3	Smart Agricultural Technology	2021	https://doi.org/10.1016/j.atech.2021.100023
Precision farming ……: A meta-analysis	E. Anastasiou +11	Smart Agricultural Technology	2023	https://doi.org/10.1016/j.atech.2023.100323
Making Sure What ……..s of Elementary Science	P. B. Mesquita	Contemporary Issues in Technology and Teacher Education	2010	https://citejournal.org/volume-10/issue-3-10/science/making-sure-what-you-see-is-what-you-get-digital-video-technology-and-the-preparation-of-teachers-of-elementary-science
FlyDetector Automated ……. Using Digital Paradigm	Yuanyuan Huang +5	Sensors/Basel	2023	https://doi:10.3390/s23167073
Advanced Imaging Techniques II: …….. Specimens	M. Buffington +1	American Entomologist	2008	https://doi.org/10.1093/ae/54.4.222
Remote-Controlled …… an Unmanned Aerial Vehicle	K. Kakutani +5	Agriculture MDPI	2021	https://doi.org/10.3390/agriculture11020176
Biomechanics of insect cuticle: …….. challenge	K. Stamm +2	Applied Physics A	2021	https://doi.org/10.1007/s00339-021-04439-3
Use of synchrotron …… anatomy in insects	J. Socha +1	Optical Engineering + Applications	2008	https://doi.org/10.1117/12.795210

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Title	Authors	Source	Year	
Insect imaging at the ……. radiation facility	T. V. D. Kamp +4	Entomologie heute	2013	https://www.zobodat.at/pdf/Entomologie-heute_25_0147-0160.pdf
Bioluminescent imaging …….. in Rhodnius prolixus	C. Henriques +4	Parasites & Vectors	2012	https://DOI:10.1186/1756-3305-5-214
An Effort in Teaching …….. to the Students	I D T Putri +1	Journal of Physics: Conference Series	2019	https://DOI:10.1088/1742-6596/1417/1/012075
Measuring the angle ……. two-dimensional images	Willmott +1	Journal of Experimental Biology	1997	https://doi.org/10.1242/jeb.200.21.2693
Comprehensive evaluation …… metabolomics and lipidomics	S. Meyer +9	Journal of Animal Science and Biotechnology	2020	https://doi:10.1186/s40104-020-0425-7
Micro-CT and deep learning: ……. neuroscience	Thorin Jonsson	Frontiers in Insect Science	2023	https://doi.org/10.3389/finsc.2023.1016277
Living specimens ……. microscopic observation	A. A. Ahmad Zahidi +4	Microscopy research and technique (Print)	2019	https://doi:10.1002/jemt.23340.
Tenebrio molitor …….., and Cecal Microbiome	A. Benzertiha +6	Animals	2019	https://DOI:10.3390/ani9121128
Optical Coherence Tomography ……. Biology	Jing Men +9	IEEE Journal of Selected Topics in Quantum Electronics	2016	https://doi:10.1109/JSTQE.2015.2513667
Diversity and impacts of …… biosecurity opportunities	M. McNeill +7	NeoBiota	2021	https://doi.org/10.3897/neobiota.65.61991
DNA insecticides: …….. (Lymantria dispar L.) larvae	N. Mutah +1	International Journal of Pest Management	2018	https://doi.org/10.1080/09670874.2017.1359432
The pregenital abdomen …… dawn of heteropteran evolution.	L. Davranoglou +4	Arthropod structure & development	2017	https://doi.org/10.1016/j.asd.2017.08.006
Bellymount enables ……. in adult Drosophila	L. Koyama +7	bioRxiv	2019	https://doi:10.1371/journal.pbio.3000567
A rapid method for …….. using image analysis	L. Qiu +1	Nematology	1999	https://doi.org/10.1163/156854199508612
The Antisteatotic and Hypolipidemic …… 1- Carbon Metabolism	S. Meyer +7	Molecular Nutrition & Food Research	2019	https://doi.org/10.1002/mnfr.201801305
Biological Investigation …… Manduca Sexta	Travis B. Tubbs +2	International Journal of Micro Air Vehicles	2011	https://doi.org/10.1260/1756-8293.3.2.101
Lensless digital holography …… phase mask.	S. Bernet +3	Optics Express	2011	https://doi.org/10.1364/OE.19.025113
Visualization of pH …… 31P-NMR microscopy	U. Skibbe +4	Journal of Insect Physiology	1996	https://doi.org/10.1016/0022-1910(96)00019-4
Interactions between …….. meta-analysis.	Juan-Ying Li +4	Journal of Hazardous Materials	2023	https://doi.org/10.1016/j.jhazmat.2023.132783
Scirtothrips dorsalis ……Different Continents	Vivek Kumar +6	Florida Entomologist	2011	https://doi.org/10.1653/024.094.0431
The Utilization of Full-Fat Insect ……. Tract Histomorphology	A. Józefiak +5	Annals of Animal Science	2019	https://doi.org/10.2478/aoas-2019-0020
Evolution of Mosquito-Based …….. in Australia	A. F. van den Hurk +4	Journal of Biomedicine and Biotechnology	2012	https://doi.org/10.1155/2012/325659
Elytral Punctures: A Rapid, …….. Potato Beetle	T. Unruh +1	Canadian Entomologist	1993	https://doi.org/10.4039/Ent12555-1
Predicting Fruit Fly …….. DeepLabCut	Sanghoon Lee +5	International Conferences on Biological Information and Biomedical Engineering	2021	https://doi.org/10.1109/BIBE52308.2021.9635290

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Title	Authors	Source	Year	
Regularized inverse …….. 3D particle tracking.	K. Mallery +1	Optics Express	2019	https://doi.org/10.1364/OE.27.018069
Electrical Stimulation of ……. Initiating Flight	H. Y. Choo +3	PLoS ONE	2016	https://doi.org/10.1371/journal.pone.0151808
Multidecadal, county-level …… in China	Wei Zhang +9	PNAS	2018	https://doi.org/10.1073/pnas.1721436115
Data reliability in citizen science…….. insects visiting ivy flowers	F. Ratnieks +5	Methods in Ecology and Evolution	2016	https://doi.org/10.1111/2041-210X.12581
Reduced-Order Forward …….for Dipteran Insects	Imraan A. Faruque +2	AIA A guide, Navigation and control conference	2012	https://doi.org/10.2514/6.2012-4978
Surveillance of a …… during 2009–2015	I. Ruíz-Arrondo +4	International Journal of Environmental Research and Public Health	2020	https://doi.org/10.3390/ijerph17103734
A Stochastic …… Life History Data	P. L. Munholland +2	conference: Estimation and Analysis of Insect Populations.	1989	https://doi.org/10.1007/978-1-4612-3664-1_8
Meta-Analysis …… in Insects.	H. Bono	Antioxidants	2021	https://doi.org/10.3390/antiox10030345
Optimal Cotton ……: A Meta-Analysis	Terry W. Griffin +1	Journal of Economic Entomology	2016	https://doi.org/10.1093/jee/tow119
Arthropods as …… in Canadian forests	D. Langor +1	The Forestry Chronicle	2006	https://doi.org/10.5558/tfc82344-3
Insights into the molecular …… among insects	O. Shimmi +2	Proceedings of the Royal Society B: Biological Sciences	2014	https://doi.org/10.1098/rspb.2014.0264
Ability of near-infrared …….. and optical measurement modes.	B. Jamshidi	Spectrochimica Acta Part A - Molecular and Biomolecular Spectroscopy	2020	https://doi.org/10.1016/j.saa.2019.117479
Applying x-ray ……. and memory	M. Greco +1	Biomedical Physics & Engineering Express	2017	https://DOI10.1088/2057-1976/aa6307
Insect flight dynamics and control	G. Taylor +2	AIA A guide, Navigation and control conference	2006	http://dx.doi.org/10.2514/6.2006-32
The tracheal system ……mealworm beetle	Marcin Raś +2	Journal of Anatomy	2018	https://doi.org/10.1111/joa.12808
The world's 100 worst …….non- invasive species	Zihua Zhao +6	Journal of Applied Ecology	2023	https://doi.org/10.1111/1365-2664.14485
On The Genus Pseudolynchia Bequaert (Diptera : Hippoboscidae)	By T. C. Maa	Pacific Insects Monograph	2006	http://hbs.bpbmwebdata.org/pim/pdf/pim10-125.pdf
Deciphering the Role …… via Free Flight Stimulation	Hirotaka Sato +9	Current Biology	2015	https://doi.org/10.1016/j.cub.2015.01.051
Senescence in wild insects: Key questions and challenges	Felix Zajitschek +2	Functional Ecology	2019	https://doi.org/10.1111/1365-2435.13399
Maize Combined …… Tissue-Specific QTL Meta-Analyses	A. Badji +12	Frontiers in Plant Science	2018	https://doi.org/10.3389/fpls.2018.00895
Potential of Unmanned Aerial ……. Fields	H. Kim +2	Florida Entomologist	2018	https://doi.org/10.1653/024.101.0229
Thermographic analysis …… insect pupae	R. Olsen +1	Radio Science	1982	https://doi.org/10.1029/RS017i05Sp0095S
Using Microfluidics Chips …….. in Drosophila Larvae	Bibhudatta Mishra +7	Journal of Visualized Experiments	2014	https://doi.org/10.3791/50998

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Title	Authors	Source	Year	
Functionalized carbon ……. neural implants	E. Buschbeck +4	Journal of Neuroscience Methods	2021	https://doi.org/10.1016/j.jneumeth.2021.109370
Field performance …….. an uncrewed aerial vehicle	Jérémy Bouyer +16	Science Robotics·	2020	https://doi.org/10.1126/scirobotics.aba6251
Low-Cost Live ……: iDrone Bee	Jae Hyeon Ryu +2	Journal of Insect Science	2022	https://doi.org/10.1093/jisesa/ieac036
Image Analysis of …… , Sultan Kudarat , Philippines	M. Torres +2	Biology, Environmental Science	2011	https://api.semanticscholar.org/CorpusID:172132279
The first extinct species ……. using X-ray micro-computed tomography.	A. Bukejs +3	Zootaxa	2021	https://doi.org/10.11646/zootaxa.4995.2.7
Numerical Simulation ……. at Various Flying Conditions	N. Prasath +5	12th International Energy Conversion Engineering Conference	2014	https://doi.org/10.2514/6.2014-3763
A Special Collection: Drones to Improve Insect Pest Management	Nathan Moses-Gonzales +1	Journal of Economic Entomology	2021	https://doi.org/10.1093/jee/toab081
Drone-Netting' for Sampling Live Insects	Helge Löcken +3	Journal of Insect Science	2020	https://doi.org/10.1093/jisesa/ieaa086
Combined Sterile Insect …… Pilot Suppression Trial in Thailand	P. Kittayapong	Area-Wide Integrated Pest Management	2021	https://doi.org/10.1371/journal.pntd.0007771
A combined experimental-computational …….. mosquitoes (Anopheles)	U. Bernier +7	PLoS Neglected Tropical Diseases	2019	https://doi.org/10.1371/journal.pntd.0007188
Effect of cold plasma on mortality of Tribolium castaneum on refined wheat flour	R. Mahendran	Proceedings of the 10th International Conference on Controlled Atmosphere and Fumigation in Stored Products	2016	
Measurement of arthropod ……. magnetic resonance	Sacha M. O'Regan +2	Invertebrate Biology	2012	http://www.jstor.org/stable/23280384
Exploratory Structural ……-Inspired MAV's Thorax	L. Demasi +3	International Journal of Micro Air Vehicles	2012	https://doi.org/10.1260/1756-8293.4.4.291
MP03-07 live imaging …….using co2 anesthesia and micro-ct	Kait Al +7	Journal of Urology	2019	https://doi.org/10.1097/01.JU.0000554939.95958.c8
Histological description of ……. to environmental monitoring	Erika M. Ospina-Pérez +3	Microscopy research and technique (Print)	2019	https://doi.org/10.1002/jemt.23278
Study of ultrasonic ……. littoralis BIOLOGY	Ghada H. A. Habashy +3	Zagazig Journal of Agricultural Research	2018	https://zjar.journals.ekb.eg/article_47887_2211fe1ef494fede43f1eff85374cd98.pdf
Ultra morphology of …….. (Diptera Tephritidae)	F. Caetano +6	Brazilian Journal of Morphological Science	2006	https://pesquisa.bvsalud.org/gim/resource/en,au:%22Martins%20Neto,%20Viviana%22/lil-644249
Development of a …….. for Aerial Insect Sampling	M. Mulero-Pázmány +10	Drones	2022	https://doi.org/10.3390/drones6080189
Research on Key ……. on Electrical Stimulation	Yu Feng +3	Italian National Conference on Sensors	2019	https://doi.org/10.3390/s20010239
Insect phylogenetics in the digital age	C. Dietrich +1	Current Opinion in Insect Science	2016	https://doi.org/10.1016/j.cois.2016.09.008
Análise Sobre …….Insetos Preservados A Seco	L. Moura +1	Plural Design	2021	https://doi.org/10.21726/pl.v3i1.62
An automated device …… all-side multi-view imaging	B. Ströbel + 3	ZooKeys	2018	https://doi.org/10.3897/zookeys.759.24584
Effect of formulations …… sprayed by UAV	M. Zeeshan + 7	Frontiers in Plant Science	2024	https://doi.org/10.3389/fpls.2024.1441193

To present the results clearly, a table summarizing the titles, sources, year of publication, and authors of the relevant articles was compiled (Table 1). This table provides an overview of the key publications that were retrieved in the search process. However, the complete title and column of summary of each article was not added, but the accuracy was confirmed for each article titles and their summary and the information was accurate.

The results obtained from the Elicit-AI literature search provided valuable insights into the ongoing trends and challenges in the Digitalization of Insect Science. One of the primary advantages of using Elicit-AI for this literature review was its ability to identify emerging trends in the Digitalization of Insect Science. Many of the articles retrieved highlighted key areas where digital technologies are having a significant impact on research and practice. For example, digital technology is being used in insect study. This is particularly useful in entomology, where traditional identification methods are often time-consuming and require expertise in taxonomy. The articles also showcased advancements in behavioral modeling and ecological monitoring using digital tools, such as remote sensing and automated data collection platforms, to track insect populations and their environmental interactions.

Additionally, digital technologies such as geospatial analysis and AI-driven ecological models were identified as useful tools for studying insect populations in different ecosystems. The ability to analyze complex environmental data and predict ecological trends in real time represents a powerful advancement for the field of entomology, and the reviewed articles provided case studies on their application. Another significant benefit of using Elicit-AI was its ability to highlight gaps in the literature and areas for future research. The articles provided a clear indication of where the field is heading and where additional research could make a meaningful contribution. This insight is particularly useful for researchers who are interested in exploring underdeveloped areas in digital entomology.

Discussion

The results of the literature search demonstrated that Elicit-AI is a highly effective tool for automating parts of the literature review process in specialized research areas like insect science. By leveraging advanced language models, Elicit-AI provided access to a wide range of relevant academic sources, effectively identifying key articles in areas such as species identification, ecological monitoring, and AI applications in insect research. This capability allowed the review process to be conducted efficiently, saving time and effort typically required for manual searches. The fact that Elicit-AI flagged and excluded articles that were unrelated to insect science shows the tool's ability to filter out irrelevant content and focus on articles directly related to the specific research question. This is a major advantage in conducting literature reviews, particularly in rapidly evolving fields like digital technologies in entomology, where large volumes of papers are published frequently.

While Elicit-AI proved to be a valuable tool for this review, some limitations were observed. The most notable limitation was the retrieval of conference proceedings, which are often not included in major databases like Google Scholar. While this is not necessarily a flaw in the tool, it does highlight the fact that conference proceedings can represent a significant body of work that may not be captured in AI-driven searches. Additionally, the tool retrieved one article that did not exist in Google Scholar, suggesting that there may be occasional inaccuracies in the sources the tool indexes. This could be a result of discrepancies in how different databases or journals index their content, but it does point to the importance of cross-checking the retrieved articles for verification. Despite these challenges, the overall accuracy of the tool in identifying and summarizing relevant research was impressive.

When relating our findings with those previous available studies in the literature (Van der Mierden *et al*., 2019; Harrison *et al*., 2020; Cowie *et al*., 2022), it is clear that systematic literature review (SLR) tools have experienced considerable development and refinement in recent years. Notably, the features within the functionality category have seen the most significant improvements, and many of these enhancements are now regarded as standard capabilities in modern tools. This trend underscores the growing sophistication and utility of SLR tools, making them more effective and user-friendly for researchers. Bernard *et al*. (2025) assessed the contribution of Elicit based on three criteria: repeatability, reliability and accuracy, and they suggest that Elicit can serve as valuable complementary tools when planning or writing systematic reviews. Whitfield and Hofmann (2023) discussed in detail about Elicit-AI, how it works, and what feature make this tool different from other research engines.

Ever since 2023, a new wave of AI tools aimed at assisting researchers has arisen, mostly driven by advancements in Large Language Models (LLMs) (Sanderson, 2023). Various major bibliographic-related search engines are now incorporating LLM technology into their platforms. For example, Scopus and DimensionsFootnote18 are developing their own chatbot engines, with plans to launch them throughout 2024 (Van Noorden, 2023; Aguilera-Cora *et al*., 2024). Likewise, CORE Footnote 19 offering access to over 280 million articles, recently introduced the prototype CORE-GPT an enhanced version capable of answering natural language queries by retrieving relevant information from

these papers (Pride *et al.*, 2023).

In addition to natural language query capabilities, some of the tools offer extra search types to enhance the research process. For example, Evidence Hunt enables users to find articles by means of keywords, medical specializations, or PubMed-specific filters. Likewise, Scite allows keyword searches within paper's titles and whole abstracts, and distinctively, it can explore for specific terms inside "citation statements" sections of text including a citation (Nicholson *et al.*, 2021; Ding *et al.*, 2014). Moreover, both Scispace and Elicit enable users to inevitably extract information from articles according to predefined categories. Though, the accuracy of the extracted findings depends heavily on both the tool used and the specific query. Kung (2023) reported that there are similar AI products such as research rabbit, connected papers and scholarcy, but Elicit is novel in synthesizing literature that allows researchers to investigate additional questions in an article. A recent study by Spillias *et al.* (2024) reported that Elicit outperformed in comparison to GPT4x1 ($p < 0.001$) and GPT4x3 ($p < 0.001$) by a significant margin, suggesting that its extractions were more in line with the quality deemed acceptable by reviewers.

AI-powered research assistants have the potential to greatly support researchers by handling a range of essential tasks, such as creating a comprehensive review of literature, finding novel scientific hypotheses, and driving advances in research methodologies. However, it is the responsibility of the research community to guide the development of AI, ensuring that biases are minimized and strict ethical standards are maintained. As AI continues to transform numerous fields, it is important to recognize that human critical thinking and creativity remain indispensable, and these qualities should continue to be a central responsibility of researchers.

Conclusions

Overall, the use of Elicit-AI for literature searching has proven to be a highly effective method for reviewing a topic. By automating the process of retrieving and summarizing relevant research, Elicit-AI has facilitated a complete overview of the current state of digital technologies in insect science, which I selected as a sample topic. The insights gained from this review ranging from the opportunities offered by AI to the challenges of data integration will be valuable for researchers seeking to advance knowledge in the Digitalization of Insect Science. Future research, driven by interdisciplinary collaboration and focused on overcoming existing challenges, will play a pivotal role in shaping the future of insect science in the digital age.

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The study adheres to a predetermined set of ethical principles and guidelines.

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The author has declared no conflict of interest.

Declaration of generative AI and AI-assisted technologies in the writing process
No Generative AI and AI-assisted technologies wer used in the writing process.

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