Newsletter N°13 on Insects for feed, food and bioconversion of organic substrates

Items published between 01 January and 30 April 2025

This newsletter is produced by a research team on entomoconversion and the “Direction pour la Science Ouverte” (DipSO). It is the result of multi- source monitoring (media, articles, ...).

Scope :

- **Europe/France**
- **Thematics axes** : insects (Tenebrio molitor et Hermetia Illucens) , substrates (organic waste, by-products, ...), industrials applications and products (frass, fertilizer, ...)
- **Sources** : articles, information on ongoing and completed projects, regulatory documents, calls for expressions of interest, private sector activities.

Note : Items in this newsletter do not represent INRAE's position.

Call for proposals, call for tenders, congress

Sources : ANR, Horizon Europe, BPI...

01/04/2025

CONGRESS 2025 – InsectERA – June 11th

Participants in the 2nd InsectERA Congress (June 11th, 2025) can submit abstract proposals for poster presentation (in the Poster Session) during the Congress. :: Abstracts must be submitted using the form on the button below by May 14th, 2025, at 23:59 (UTC+1). Read the Regulations and make your submission using the button below:

www.insectera.pt

01/04/2025

22 mai 2025 : séance de l’Académie vétérinaire de 14h00 à 18h00 ayant pour thème : « La filière des insectes comestibles, 10 ans après « l’appel » de la FAO, où en est-on en France ? »

1 17/18 & 19 juin 2025 : XIe Conférence Parmenides organisée par le CIHAM et le GID Actualité 2 3 4 5 6 ...

www.academie-agriculture.fr

01/04/2025

Black Soldier Fly conference 2025, 8 - 10 September 2025

After the incredible response to our first event, we're thrilled to announce that the Black Soldier Fly Conference is back! Bringing together global researchers, industry leaders, and innovators, BSFCON 2025 explores the science, technology, and commercial applications of the Black Soldier Fly. The conference opens on 8 September with an industry-focused day on scaling, regulation, and market trends, followed by a two-day academic ...

www.bsfcon.com

Substrate - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

15/01/2025

Innovative Insect-Based Bioconversion System Paves the Way for Sustainable Plastic Waste Management

A research collaboration between the University of Castilla-La Mancha in Spain and the University of Newcastle in Australia has resulted in a groundbreaking two-stage bioconversion system aimed at tackling two pressing global environmental issues: plastic pollution and organic waste management. This innovative approach leverages the natural abilities of insect larvae, specifically mealworms and black soldier [...]

scienmag.com

hermetia illucens | tenebrio molitor

17/01/2025

Canadian partnership to transform fish waste into insect meal - Aquafeed.com

Canadian partnership to transform fish waste into insect meal Aquafeed.com

consent.google.com

27/01/2025

Revolutionizing Waste Management: Insect-Driven Bioconversion

A proposed bioconversion system effectively transforms plastic waste into biochar, addressing environmental challenges and promoting sustainable agriculture.

www.azocleantech.com

hermetia illucens

01/02/2025

Bioconversion by insects: an innovative solution for the recovery of agri-food by-products and agricultural residues - Veolia

Bioconversion by insects: an innovative solution for the recovery of agri-food by-products and agricultural residues Veolia

consent.google.com

16/02/2025

Can this common insect be an answer to the the ever growing problem of waste management - The Times of India

Can this common insect be an answer to the the ever growing problem of waste management The Times of India

consent.google.com

28/02/2025

Turning waste into wealth with insect-based biotech

Entomal has treated over 22.5 tons of food waste to date, preventing roughly 55 tons of carbon emissions.

www.japantimes.co.jp

hermetia illucens

20/03/2025

Valoriser les résidus organiques pour produire des insectes : une filière aux multiples promesses

[Blog de Emmanuel Adler] La valorisation des résidus organiques pourrait connaître une nouvelle évolution avec l'alimentation d'insectes destinés à l'alimentation. Tous les feux sont au vert pour cette nouvelle filière nous explique Emmanuel Adler, président du Réseau interprofes

www.actu-environnement.com

hermetia illucens

21/04/2025

Insects could transform plastic waste into protein

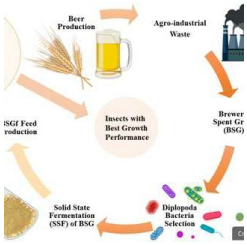
To date, at least 11 insect species, mostly in the larval stage, have been identified as capable of biodegrading plastics. The most thoroughly documented in terms of efficiency are T. molitor, Tenebrio obscurus, Zophobas atratus, and Galleria mellonella —all noted for their ability to consume and transform EPS and other types of plastic. Similar behaviors [...] Insects could transform plastic waste into protein yazısı ilk önce Feed ...

www.feedandadditive.com

tenebrio molitor

Substrate - articles

Sources : HAL, Pubmed, BASE, MDPI, F100Research, Jounal of Insects as Food and Feed, ...



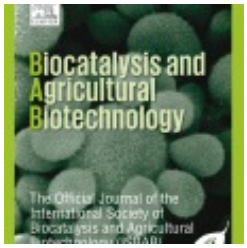
28/04/2025

Bacteria Associated with Diplopods Used to Ferment Brewery Waste and Develop Insect Feed - Santos-Silva et al.

In this work, we explored brewery spent grains (BSG), fermented in the solid-state (SSF), to produce insect feed within the concept of a circular economy. Our objectives were (i) to select efficient bacteria in the SSF of BSG; (ii) to evaluate the growth of Galleria mellonella and Tenebrio molitor larvae fed diets prepared with BSG and fermented BSG (BSGf); (iii) to estimate the proportion of proteins and carbohydrates acquired ...

link.springer.com

tenebrio molitor hermetia illucens

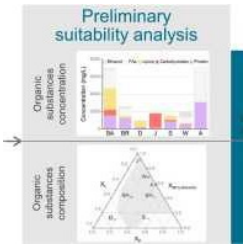


18/04/2025

Determination of black soldier fly (Hermetia illucens L.) growth and nutrition on food waste and bovine blood mixture as a feedstock - Permana et al.

Bovine blood is considered one of the major biowastes in a slaughterhouse that contains high nutrition that can be recycled and utilized, especially p...

www.sciencedirect.com



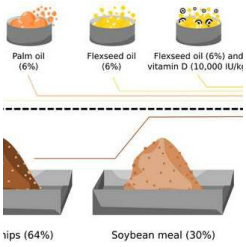
17/04/2025

Treatment of food processing wastewaters by using Black Soldier Fly larvae: Preliminary results - Grossule et al.

The biological process based on the use of Black Soldier Fly larvae (BSFL) has emerged as an innovative treatment technology for high organic content ...

www.sciencedirect.com

hermetia illucens



12/04/2025

Enriching Substrate with Fatty Acids and Vitamin D: Effect on Growth and Nutrient Transfer in Hermetia illucens Larvae - Alifian et al.

Hermetia illucens larvae, commonly known as black soldier fly maggots, have the potential to produce fatty acids and vitamin D. This study examines the effects of fatty acids and vitamin D on maggot growth performance, fatty acid and vitamin D deposition, and transfer efficiency. The larvae were raised on a basal substrate added with 6% chicken fat (T0), 6% palm oil (T1), 6% flaxseed oil (T2), and 6% flaxseed oil combined with ...

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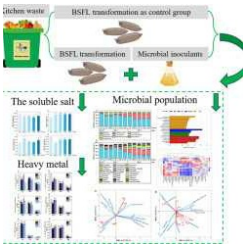
hermetia illucens



11/04/2025

Bacillus and lactic acid bacteria inoculation to transform kitchen waste using Hermetia illucens - Deng et al.

In this study, Bacillus mojavensis and Lactiplantibacillus herbarum were used to co-treat kitchen waste (KW) with Black soldier fly larvae (BSFL). The...

www.sciencedirect.com

hermetia illucens

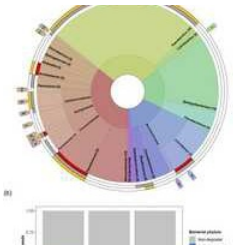
08/04/2025

Unlocking the potentials of the discarded: suitability of common food and fruit wastes in Ilorin metropolis for rearing black soldier fly, Hermetia illucens L. larvae - Ojumoola et al.

The black soldier fly, Hermetia illucens L. is a non-vector insect whose larva has the potential to convert organic wastes streams into quality protein biomass. High-quality black soldier fly larvae (BSFL) offer livestock farmers an opportunity to reduce production costs and earn more. However, all organic wastes are not equal in economic value or their suitability as BSFL rearing substrates. To ensure sustainable commercial BSFL ...

link.springer.com

hermetia illucens



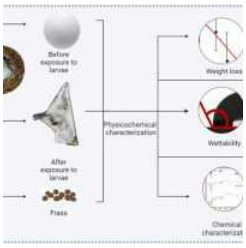
07/04/2025

Examining the potential of plastic-fed black soldier fly larvae (Hermetia illucens) as “bioincubators” of plastic-degrading bacteria - Dragone et al.

AbstractAims. Larvae of the black soldier fly (BSFL), Hermetia illucens, are recognized for their remarkable feeding flexibility and ability to convert a v

academic.oup.com

hermetia illucens



05/04/2025

Effect of supplemented diet on the kinetic profile of polystyrene biodegradation by Tenebrio molitor larvae: Physical, chemical, thermal, wettability and zeta potential measurements - Bebber et al.

Polystyrene (PS), a major contributor to plastic pollution, is non-biodegradable and widely produced. However, Tenebrio molitor larvae (mealworms) can...

www.sciencedirect.com

tenebrio molitor

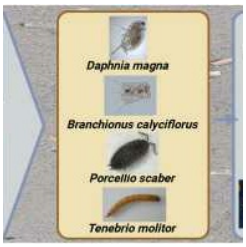
02/04/2025

Decomposition and Characteristics of Pig Manure–Sawdust Mixture Composted by Black Soldier Fly (Hermetia illucens L.) Larvae - Choi et al.

Interest in using insects to treat surplus manure without environmental impacts is growing. Black soldier fly (BSF, Hermetia illucens L.) larvae show promising potential for transforming organic wast...

onlinelibrary.wiley.com

hermetia illucens



02/04/2025

Microplastics from cigarette filters: Comparative effects on selected terrestrial and aquatic invertebrates - Dolar et al.

Cigarette filters comprise plasticised cellulose acetate, a synthetic polymer categorized as bioplastic. They represent a significant source of microp...

www.sciencedirect.com

tenebrio molitor

28/03/2025

Insect-mediated valorisation of anaerobically digested aquaculture waste: bioconversion performances, nutritional composition and microbial safety of black soldier fly larvae - Rossi et al.

Insect-mediated valorisation of anaerobically digested aquaculture waste: bioconversion performances, nutritional composition and microbial safety of black soldier fly larvae† Received 31st December 2024 , Accepted 18th March 2025 First published on 28th March 2025 Abstract Recent studies have suggested that fresh aquaculture waste (ASW) could be satisfactorily treated with black soldier fly larvae (BSFL). However, pre-treatments such as drying or dewatering, which significantly modified the chemical, physical and microbiological ...

pubs.rsc.org

hermetia illucens

27/03/2025

The impact of scale and frass recirculation on pathogen inactivation dynamics in black soldier fly larvae bioconversion - Lalander et al.

1 Introduction Over two billion tonnes of municipal solid waste are generated globally every year, and this is projected to nearly double, reaching almost four billion tonnes annually by 2050 if significant changes are not made regarding how these materials are managed. Although there are large regional differences, the biodegradable fraction of waste (biowaste) constitutes around 50% of the total amount of waste worldwide. In 2020, 38% of the waste generated globally was not handled in any way (uncontrolled handling), whilst 30% of the ...

www.frontiersin.org

hermetia illucens

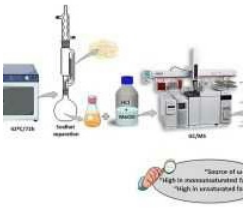
24/03/2025

Concentrations of fat-soluble vitamins and carotenoids in black soldier fly larvae (Hermetia Illucens) fed with fermented authorized and unauthorized biowaste in Europe - Papin et al.

The nutritional and market values of black soldier fly larvae (BSFL) can be improved by enriching them with compounds of interest. It has recently bee...

www.sciencedirect.com

hermetia illucens



19/03/2025

Insight into the chemical and nutritional fat profile of Tenebrio molitor larvae reared on different Agri-food by-products - Morales et al.

Insects are capable of feeding with a variety of substrates, being possible obtaining products rich in protein using by-products from agri-food indust...

www.sciencedirect.com

tenebrio molitor

18/03/2025

Octopamine alters yellow mealworm body composition - Hill et al.

There is the potential to increase the production yield within the emerging insect industry in order to produce high-quality, sustainable protein. In ...

www.sciencedirect.com

tenebrio molitor

14/03/2025

Effects of four herbs on the composition and growth performance of Tenebrio molitor larvae - Moradei et al.

Abstract Tenebrio molitor (MWs) are able to convert grain byproducts into high-quality biomass, which can be processed into animal feed. Since several herbs are sometimes added in small quantities to some baking materials, this study examines the effects of the dietary inclusion of herbs on growth performance, nutrient composition and the antioxidant activity of MWs. The MWs were reared on a control diet consisting of wheat bran ...

brill.com

tenebrio molitor

11/03/2025

Black soldier fly larvae mediate Zinc and Chromium transformation through the ZnuCBA and citric acid cycle system - Deng et al.

Intestinal microbiota and metal regulatory proteins (MRPs) underlie the transformation of heavy metals (HMs) by the black soldier fly larvae (BSFL), b...

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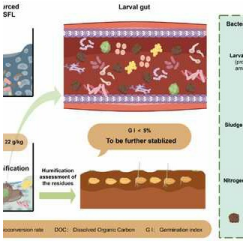
hermetia illucens



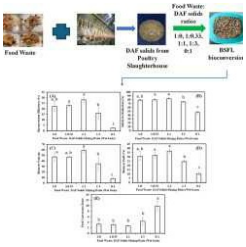
08/03/2025

Valorization of soybean-processing wastewater sludge via black soldier fly larvae: insights into the performance and bacterial community dynamics - Cui et al.

Efficient and environmentally sound treatment of soybean processing wastewater sludge is importance for industrial sustainability. Bioconversion by black soldier fly larvae (BSFL) has been extensively applied in biowaste recycling because of its efficacy and production of high-value outputs. However, the performance and underlying bacterial drivers of the BSFL-mediated sludge bioconversion require further investigation. This study ...

link.springer.com

hermetia illucens



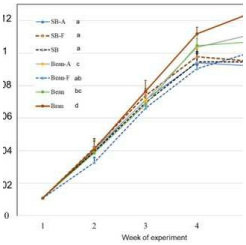
07/03/2025

Upcycling nutrients from poultry slaughterhouse solid waste into value-added bioproducts using black soldier fly larvae cultivation - Shanmugam et al.

The objective of this work was to test the hypothesis that black soldier fly larvae (BSFL) can be grown successfully on dissolved air flotation solids...

www.sciencedirect.com

hermetia illucens



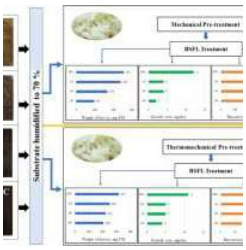
05/03/2025

Utilising common bean and strawberry vegetative wastes in yellow mealworm (Tenebrio molitor) substrates: effects of pre-treatment on growth and composition - Yakti et al.

Integrating plant production with insect farming, termed "entomoponics," involves using plant waste as a substrate for insect rearing, while returning insect frass to fertilise the plants. In this study, vegetative wastes from strawberry (Fragaria x ananassa), and common bean (Phaseolus vulgaris), were incorporated into a wheat bran-based substrate for rearing the yellow mealworms (MW; Tenebrio molitor). The wastes were either ...

www.nature.com

tenebrio molitor



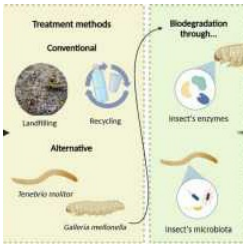
01/03/2025

Enhancement of bioconversion of vegetable biowaste by black soldier fly larvae: Influence of mechanical and thermomechanical pretreatments - El-byari et al.

In many countries, the growing production of biowaste poses a major environmental threat, requiring significant budgets for its management. This issue...

www.sciencedirect.com

hermetia illucens



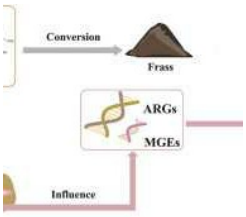
28/02/2025

Can the insects Galleria mellonella and Tenebrio molitor be the future of plastic biodegradation? - Burd et al.

Plastics have been an integral part of human lives, enhancing the functionality and safety of many everyday products, contributing significantly to ou...

www.sciencedirect.com

tenebrio molitor



27/02/2025

Characteristics of intestinal microbial communities and occurrence of antibiotic resistance genes during degradation of antibiotic mycelial residues by black soldier fly (Hermetia illucens L.) larvae - Pei et al.

The disposal of antibiotic mycelial residues (AMR) presents a distinctive challenge as hazardous organic waste, posing a persistent dilemma for pharma...

www.sciencedirect.com

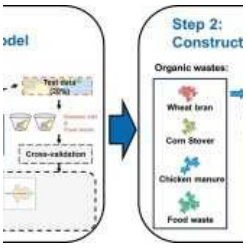
21/02/2025

Efficacy of black soldier fly larvae in converting kitchen waste and the dynamic alterations of their gut microbiome - Xu et al.

The escalating demand for food, driven by population growth and improved living standards, has prompted the development of efficient and eco-friendly ...

www.sciencedirect.com

hermetia illucens



17/02/2025

A machine-learning approach to optimize nutritional properties and organic wastes recycling efficiency conversed by black soldier fly (Hermetia illucens) - Feng et al.

Suboptimal nutrition in organic waste limits the growth of black soldier fly (BSF) larvae, thereby reducing biowaste recycling efficiency. In this stu...

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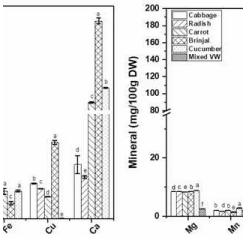
hermetia illucens



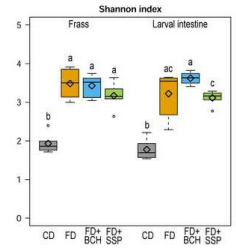
12/02/2025

Influence of fruit and vegetable waste substrates on the nutritional profile of black soldier fly (Hermetia illucens) larvae and prepupa - Rampure et al.

The black soldier fly, Hermetia illucens, larva is widely recognized for efficiently converting organic biowaste into high-quality biomass, making it a key player in organic waste management. However, the nutritional value of the black soldier fly larvae (BSFL) is dependent on the substrates they feed on. This study investigated the nutritional profiles of different stages of BSFL- 3rd instar to 5th, and prepupa, reared on two ...

link.springer.com

hermetia illucens



11/02/2025

Microbial profiling of black soldier fly larvae reared on substrates supplemented with different mineral sources originating from phosphorus recycling technologies - Reyer et al.

Background Innovations to establish agricultural value chains utilising side streams and their reintegration into the feed and food supply are of great importance. Recyclates derived from biomass and waste are therefore becoming increasingly important as sources of nutrients. The larvae of the black soldier fly (BSF; Hermetia illucens) demonstrate considerable potential as livestock feed due to their ability to utilise a wide range ...

link.springer.com

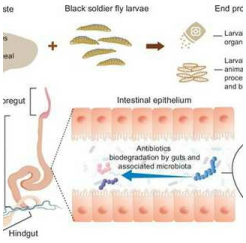
10/02/2025

Expanding black soldier fly (BSF; Hermetia illucens; Diptera: Stratiomyidae) in the developing world: Use of BSF larvae as a biological tool to recycle various organic biowastes for alternative protein production in Nepal - Gautam et al.

The growing global demand for food, particularly animal protein, is intensifying challenges related to food security and environmental sustainability....

www.sciencedirect.com

hermetia illucens



10/02/2025

Black soldier fly: a new model for bioremediation of antibiotic pollutants - Xu et al.

Insects, as a dominant portion of animal biomass, are present in all terrestrial ecosystems and perform important ecological roles such as pollination, her

academic.oup.com

hermetia illucens

05/02/2025

Effects of swine manure mixed with circulating fluidized bed fly ash on black soldier fly (Diptera: Stratiomyidae) larvae and larval frass - Hao et al.

The mixture of swine manure and inorganic CFA could be processed by the BSFL. The addition range of 2.5%−5% had less effect on larval growth, except for delaying the time when the larvae attained the...

onlinelibrary.wiley.com

hermetia illucens

03/02/2025

Enhancing Tenebrio molitor Larvae Growth and Nutrition: The Potential of Wheat Bran and Coffee Grounds Blends - Lee et al.

Coffee grounds, a solid residue left after coffee extraction, are often discarded in landfills or incinerated, posing environmental concerns. To promote sustainability, this study explores the potent...

onlinelibrary.wiley.com

tenebrio molitor

01/02/2025

Impact of Rearing Substrates on Black Soldier Fly Growth and Fertility: A Semi-Industrial Scale Study to Optimize Egg Collection - Zhang et al.

Juvenile environments can influence adult phenotypes in holometabolous insects. This study examines the effects of larval rearing substrates on the reproductive outcomes of Black Soldier Flies (BSFs) at a semi-industrial scale. Larvae were reared on five substrates. Larval growth, adult size, and reproductive performance were monitored, with a specific focus on egg production and hatching rates across 17 continuous egg collection ...

www.mdpi.com

hermetia illucens

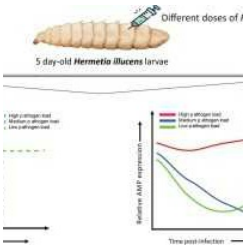
31/01/2025

Increasing food sustainability by utilization of biowaste to grow mealworms and their nutrient profile as human food - Ktil et al.

Yellow mealworm is explored globally as sustainable food, creating a need to optimize its nutritional composition. This study investigated effects of ...

www.sciencedirect.com

tenebrio molitor



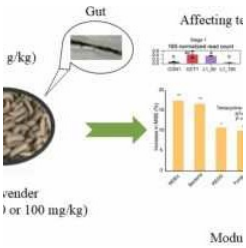
31/01/2025

Effect of the bacterial pathogen Pseudomonas protegens Pf-5 on the immune response of larvae of the black soldier fly, Hermetia illucens L. - Shah et al.

The larvae of the black soldier fly (BSFL), Hermetia illucens L. (Diptera: Stratiomyidae), are exposed to a diverse range of microorganisms within the...

www.sciencedirect.com

hermetia illucens



25/01/2025

Potential of lavender essential oil to inhibit tetracycline resistance and modulate gut microbiota in black soldier fly larvae - Wei et al.

The misuse of tetracycline in livestock farming leads to environmental residues that promote the proliferation of antibiotic resistance genes (ARGs), ...

www.sciencedirect.com

hermetia illucens

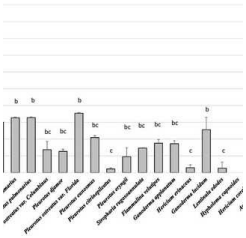
25/01/2025

Effects of feed nutrients on growth, development and the deposition of protein and fat in Tenebrio molitor larvae - Tamim et al.

Abstract An understanding of the impact of dietary nutritional composition on growth, development and composition of Tenebrio molitor larvae (mealworms) could help optimise production systems. Replicate containers of mealworms fed for 24 days on synthetic cellulose-based feeds containing different combinations of protein (casein, Cas), lipid (wheat germ oil, WGO), carbohydrate (glucose) and a mineral/vitamin premix (MV) were compared ...

brill.com

tenebrio molitor



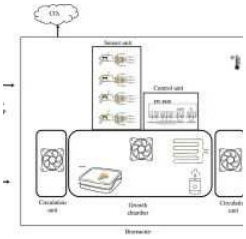
24/01/2025

Solid-state fermentation of hemp waste: enhancing the performance of Hermetia illucens larvae and altering the composition of hemp secondary metabolites - Yakti et al.

1 Introduction Hemp (Cannabis sativa L.) cultivation has been gaining momentum globally due to its multiple uses, such as the production of fibers (Sankari, 2000), seeds (Xu et al., 2022) and flowers (Carus and Sarmento, 2016). The recent reforms in cannabis regulations in several counties have sparked rapid expansion within the hemp industry, leading to the introduction of numerous innovative products in the market (Crini et ...

www.frontiersin.org

hermetia illucens



23/01/2025

Validation of a bioreactor for the growth of black soldier fly larvae: Test with animal feces, agave residues and vinasse - Cuesta-Parra et al.

For this study, a controlled and monitored bioreactor was constructed to examine the environmental variables, CO2 behavior during the biodegradation p...

www.sciencedirect.com

hermetia illucens

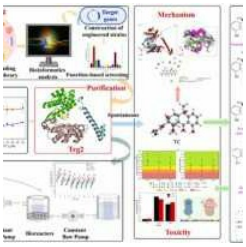
21/01/2025

Bioconversion of oil palm empty fruit bunch and kernel meal by black soldier fly (Hermetia illucens) as an alternative protein and fat sources - Bajra et al.

Indonesia obtains significant financial benefits from palm oil. However, the industry has yet to find the optimum and beneficial biomass treatment pro...

www.sciencedirect.com

hermetia illucens



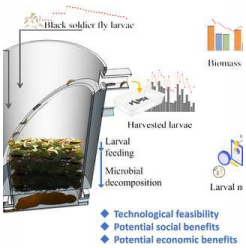
20/01/2025

Novel tetracycline-degrading enzymes from the gut microbiota of black soldier fly: Discovery, performance, degradation pathways, mechanisms, and application potential - Pei et al.

The antibiotic tetracycline (TC) is an emerging pollutant frequently detected in various environments. Although enzymatic remediation is a promising s...

www.sciencedirect.com

hermetia illucens



20/01/2025

An innovative continuous self-separation reactor to process rural food waste using black soldier fly larvae - Du et al.

The utilization of black soldier fly larvae (BSFL) in food waste treatment has garnered significant attention because of its alignment with the principles of a circular economy. However, in rural areas, inadequate management of waste segregation and a high proportion of difficult-to-decompose materials in food waste have reduced the treatment rate by BSFL. After a year-long investigation into rural food waste, we designed a BSFL ...

link.springer.com

hermetia illucens

20/01/2025

Feeding Impact on the Gut Microbiome of Hermetia illucens Larvae - Vecherskii et al.

Abstract The microbiome of the black soldier fly larvae (BSFL) formed in real rearing substrates in close to industrial conditions was studied. The used substrates, dairy waste and feeding yeasts, differed in the sources of protein, which are available in commercial rearing of the black soldier fly (BSF). Amplicon 16S rRNA sequencing of the BSFL gut metagenome reveals high variability in the microbiome composition. The only bacteria genus found in all the studied developmental stages of BSFL was Enterococcus. We identified typical micr...

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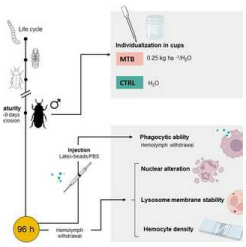
hermetia illucens



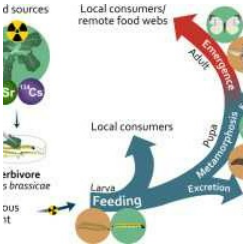
19/01/2025

Ecotoxicological Effects of the Herbicide Metribuzin on Tenebrio molitor Hemocytes - Vommaro et al.

Herbicides are synthetic chemicals that are extensively employed in agricultural practices with the objective of enhancing crop yield and quality. Despite their selectivity for plant systems and being generally regarded as non-toxic to animals, there is a paucity of understanding surrounding the sublethal effects on non-target organisms, including animals. This gap underscores the necessity for ecotoxicological research that prioritizes ...

www.mdpi.com

tenebrio molitor



17/01/2025

Radiocaesium and radiostrontium transfer to an insect herbivore and an insect detritivore through holometabolous development: A comparison between the cabbage butterfly (Pieris brassicae) and the black soldier fly (Hermetia illucens) - Andresen et al.

The presence of the long-lived radionuclides 137Cs and 90Sr in ecosystems is a major environmental concern because bioavailable forms of the radionucl...

www.sciencedirect.com

hermetia illucens

17/01/2025

Enhancing performance of black soldier fly (Hermetia illucens) larvae by feeding on king oyster mushroom as a source of β-glucan - Mansoor et al.

Abstract The study investigated the effects of dietary supplementation with king oyster mushroom (KOM) on the growth performance, nutritional properties, and β-glucan content in black soldier fly (Hermetia illucens) larvae (BSFL). Although BSFL are an excellent source of high-quality protein, they naturally have low β-glucan content, which is renowned for its potent antioxidant and anti-inflammatory properties. Using chicken feed ...

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16/01/2025

Microbial safety of black soldier fly larvae (Hermetia illucens) reared on food waste streams - Alagappan et al.

Black soldier fly larvae (BSFL) can valorise different organic matter and yield a product of high nutritional value. The lack of knowledge about the m...

www.sciencedirect.com

hermetia illucens

16/01/2025

Assessment of Hermetia illucens larvae performance reared on raw or contaminated peanut by-products with Aspergillus flavus and Fusarium graminearum - Crosta et al.

Abstract The peanut supply chain is characterised by a high production of by-products, mainly shells and small pods, often discarded by processing companies. However, the richness of nutritive substances makes these products valuable as feed substrates for Hermetia illucens larvae rearing. Therefore, the aims of this work were to (1) evaluate the performance of H. illucens larvae reared on peanut by-products and (2) study the effect ...

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hermetia illucens

16/01/2025

Risk assessment of black soldier fly (Hermetia illucens (L.), Diptera: Stratiomyidae) larvae composting for circular waste management in southern Benin - Ogbon et al.

Abstract Insect farming is becoming an important business in West Africa, and the black soldier fly (Hermetia illucens (L.), Diptera: Stratiomyidae) is one of the most widely farmed species. In this study, we investigated the potential risk factors, including heavy metals and pesticides, of the implementation of black soldier fly (BSF)-based technology for circular waste management in the context of Benin. The study was performed ...

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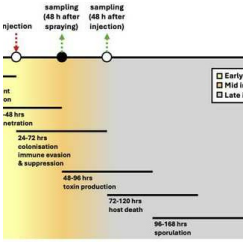

15/01/2025

Transcriptomic Analysis Reveals Molecular Mechanisms Underpinning Mycovirus-Mediated Hypervirulence in Beauveria bassiana Infecting Tenebrio molitor - Filippou et al.

Mycoviral infection can either be asymptomatic or have marked effects on fungal hosts, influencing them either positively or negatively. To fully understand the effects of mycovirus infection on the fungal host, transcriptomic profiling of four Beauveria bassiana isolates, including EABb 92/11-Dm that harbors mycoviruses, was performed 48 h following infection of Tenebrio molitor via topical application or injection. Genes that ...

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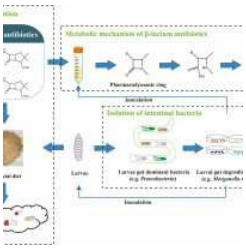

12/01/2025

Pathway of typical β-Lactam antibiotics degradation by black soldier fly and response characteristic of its intestinal microbes - Li et al.

To effectively address the contamination caused by antibiotic misuse, this study was conducted to enhance the removal of amoxicillin (AMX) and penicil...

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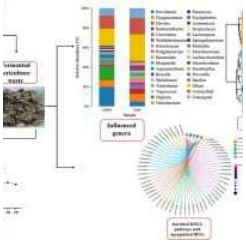
hermetia illucens



12/01/2025

Gut microbial communities and transcriptional profiles of black soldier fly (Hermitia illucens) larvae fed on fermented sericulture waste - Menon et al.

Sericulture waste poses significant challenges to industrial and environmental safety. Black soldier fly larvae (BSFL) offer a promising solution for ...

www.sciencedirect.com

hermetia illucens

11/01/2025

Processing poultry manure with black soldier fly technology lowers N2O and CO2 gas emissions from soil - Jenkins et al.

Abstract Soil amended with poultry manure has many benefits including increased nutrient and organic carbon supply, enhanced soil structure and improved crop yield. However, the direct application of poultry manure to land can be associated with significant greenhouse gas (GHG) emissions. Black soldier fly (BSF) farming (Hermetia illucens) is an emerging technology that can convert manure into protein for animal feed, with larvae ...

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hermetia illucens

09/01/2025

Fish Sludge as Feed in Circular Bioproduction: Overview of Biological and Chemical Hazards in Fish Sludge and Their Potential Fate via Ingestion by Invertebrates - Pettersen et al.

This review provides knowledge of the biosecurity risks of using fish sludge to produce novel feed ingredients from low-trophic, extractive animal species in circular value chains. The review include...

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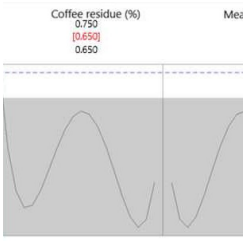
hermetia illucens



09/01/2025

Transforming Coffee and Meat By-Products into Protein-Rich Meal via Black Soldier Fly Larvae (Hermetia illucens) - Vargas-Serna et al.

In response to increasing food waste and the necessity for sustainable resource utilization, this study evaluated the effectiveness of black soldier fly (Hermetia illucens) larvae in converting a mixture of coffee and meat residues into protein-rich meal suitable for animal feed. A two-component mixture design optimized the substrate composition, followed by model validation and a comprehensive nutritional characterization of the ...

www.mdpi.com

hermetia illucens

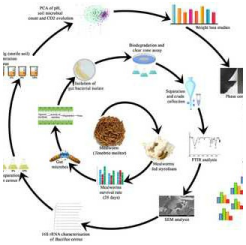
09/01/2025

Double trouble? Quantifying the risk from co-exposure to multiple pathogens in Tenebrio molitor at different CO2 concentrations - Herren et al.

The insect mass-rearing industry to produce feed and food is expanding rapidly. Insects in production frequently encounter multiple pathogens and envi...

www.sciencedirect.com

tenebrio molitor



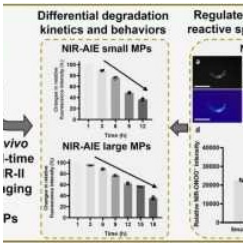
07/01/2025

Exploring the intricate studies on low-density polyethylene (LDPE) biodegradation by Bacillus cereus AP-01, isolated from the gut of Styrofoam-fed Tenebrio molitor larvae - Akash et al.

This study aims to investigate the biodegradation potential of a gut bacterial strain, Bacillus cereus AP-01, isolated from Tenebrio molitor larvae fed Styrofoam, focusing on its efficacy in degrading low-density polyethylene (LDPE). The biodegradation process was evaluated through a series of assays, including clear zone assays, biodegradation assays, and planktonic cell growth assessments in mineral salt medium (MSM) over a 28-day ...

link.springer.com

tenebrio molitor hermetia illucens



03/01/2025

In Vivo visualization of microplastic degradability and intestinal functional responses in a plastivore insect - Peng et al.

The plastivore insect Tenebrio molitor demonstrates significant potential for the rapid biodegradation and bioremediation of micro(nano)plastics. Howe...

www.sciencedirect.com

tenebrio molitor

Product - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

28/04/2025

Matopos scientists develop insect-based livestock feed

Judith Phiri, Zimpapers Business Hub USING locally available resources and insect based proteins such as mealworms and black soldier flies, scientists at the Matopos Research Institute in Matabeleland South Province have developed innovative solutions to enhance feed availability for livestock by formulating alternative animal feed. The innovation is expected to address the growing challenges in livestock [...]

www.chronicle.co.zw

tenebrio molitor | hermetia illucens

28/04/2025

□ What are the benefits of using BSF meal in dog & cat food? □ Benefit #3 Insect meal supports gut health. □Multiple studies indic...

□ What are the benefits of using BSF meal in dog & cat food? □ Benefit #3 Insect meal supports gut health. □Multiple studies indicate that BSF meal can be included at levels of 30% in □ dog & 😸 cat food while maintaining □ faecal quality. Interested? □ reach our to Chloé Champion to discuss all the benefits of BSF meal in dog & cat food. #insectindustry #insectprotein #petfoodindustry #sustainableworld #BSF

www.linkedin.com

28/04/2025

Coffee Without Beans, Medicine from Insects: Rethinking Waste in Agri-Food

With Cleantech Forum Asia 2025 just around the corner, it’s an opportune time to revisit some of the insights shared at last year’s... The post Coffee Without Beans, Medicine from Insects: Rethinking Waste in Agri-Food appeared first on Cleantech Group.

www.cleantech.com

24/04/2025

Can Insects Feed the World? GreenGrahi's ₹32 Crore Bet Says Yes! - TICE News

Can Insects Feed the World? GreenGrahi's ₹32 Crore Bet Says Yes! TICE News

consent.google.com

24/04/2025

Bug burgers don’t work, so insect industry pivots to animal feed - Euractiv

Bug burgers don’t work, so insect industry pivots to animal feed Euractiv

consent.google.com

15/04/2025

Would you eat insect-fed fish? - All About Feed

Would you eat insect-fed fish? All About Feed

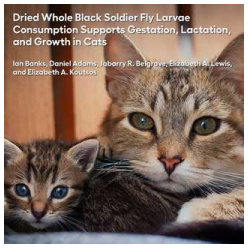
consent.google.com

15/04/2025

World’s first trout raised on insect protein hits Finnish shelves

Finland has just made seafood history. In a groundbreaking move for sustainable aquaculture, a group of 4 Finnish companies has launched what they call the world’s first commercial rainbow trout raised on insect protein. For a limited 2-week period starting April 7, Finnish grocery shoppers will find these eco-conscious fillets on store shelves – a […]

www.allaboutfeed.net



08/04/2025

Can insect protein support cats during pregnancy, lactation, and early growth? According to new research—yes, it can. A newly publ…

Can insect protein support cats during pregnancy, lactation, and early growth? According to new research—yes, it can. A newly published, peer-reviewed study in Animals confirms that Black Soldier Fly larvae (BSFL) are a safe, effective, and highly digestible ingredient for gestating and nursing queens and growing kittens. Read the full study: https://lnkd.in/e_-DW-dV Led by Drs. Ian Banks, Daniel Adams, PhD, Jabarry Belgrave, Elizabeth …

www.linkedin.com

hermetia illucens

03/04/2025

Trial finds salmon farmers gain profit with insect protein in feed

A recent trial by Aller Aqua, NMBU and Austevoll Melaks shows that adding just 4% of ProteinX, a black soldier fly meal, to Atlantic salmon feed significantly boosts yields, quality and taste

www.undercurrentnews.com

hermetia illucens

29/03/2025

Freeze drying systems for insect protein preservation and flavor

Introduction In recent years, the use of insect protein as a sustainable and nutritious food source has gained popularity. However, preserving the flavor and nutritional value of insect protein can be a challenge. Freeze drying systems have emerged as a viable solution for preserving insect protein while maintaining its taste and quality. In this report, […] The post Freeze drying systems for insect protein preservation and flavor …

essfeed.com

28/03/2025

Insect protein packaging is compact traceable and shelf ready

The Rise of Insect Protein Packaging In recent years, there has been a growing interest in alternative protein sources to meet the increasing global demand for sustainable food options. One such emerging trend is the use of insect protein as a viable and environmentally friendly source of nutrition. Insect protein is not only highly nutritious […] The post Insect protein packaging is compact traceable and shelf ready appeared first …

essfeed.com

11/03/2025

Insect-based feed ingredients in Poultry World 1

The latest edition of Poultry World is available online. In this edition we visit a Norwegian broiler farm that is achieving above-average scale and results. We speak to Ines Carvalhido from Cargill who talks about optimising layer nutrition. Also, we explore the pros and cons of open water sources in commercial duck production, and consider [...]

www.poultryworld.net

hermetia illucens

07/03/2025

Globe Buddy unveils dog treats containing insect protein at event

Danish pet food brand Globe Buddy is unveiling new sustainable dog treats at Expozoo Paris Animal Show 2025 from March 7-9. Sourced from Ÿnsect, the premium insect protein in the products is nutritious, easily digestible, and packed with essential nutrients, Globe Buddy explains. Innovative pet food brand Globe Buddy is unveiling its latest sustainable dog [...] Globe Buddy unveils dog treats containing insect protein at event yazısı ...

www.feedandadditive.com

13/02/2025

New study finds 67% prefer the taste of salmon fed with insect-based feed

Fillet gaping scores declined, reflecting a more intact structure, according to the study. Continue reading

www.salmonbusiness.com

hermetia illucens

09/02/2025

World : EU Authorises UV Treatment For Insect Powder In Food

BRUSSELS, Feb 9 (Bernama-dpa) -- Starting Monday, UV-treated insect powder, specifically powdered whole larvae of the flour beetle (Tenebrio molitor), will be permitted for use in food across the European Union, reported German news agency (dpa).

www.bernama.com

tenebrio molitor

07/02/2025

Bug appétit | Is India ready for insect protein?

...future food security.The focus is not only on insects, but the entire traditional food system — to achieve food security ... priority to research edible insects for food security. They have documented the many species across the Northeast to...

www.thehindu.com

hermetia illucens

07/02/2025

Insect-based barramundi feed launches in India

Insectika Biotech has introduced an insect protein-based feed for Asian seabass (barramundi) and aquarium fish, in collaboration with ICAR-CIBA.

thefishsite.com

hermetia illucens

05/02/2025

Packaged Feeds partners with FreezeM to advance zero-waste insect farming - PetfoodIndustry.com

Packaged Feeds partners with FreezeM to advance zero-waste insect farming PetfoodIndustry.com

consent.google.com

30/01/2025

Partial replacement of soybean oil by insect oil in broiler diets - All About Feed

Partial replacement of soybean oil by insect oil in broiler diets All About Feed

consent.google.com

27/01/2025

How to detect BSF and mealworm in insect meals and compound feed

A new study outlines an effective protocol for identifying and authenticating insect species in feed and food matrices.

www.feednavigator.com

tenebrio molitor | hermetia illucens

16/01/2025

Safety of frozen and dried forms of whole yellow mealworm (Tenebrio molitor larva) as a novel food pursuant to Regulation (EU) 2015/2283 - EFSA Panel on Nutrition

Following a request from the European Commission, the EFSA Panel on Nutrition, Novel Foods and Food Allergens (NDA) was asked to deliver an opinion on the safety of frozen, dried and powder forms of ...

efsa.onlinelibrary.wiley.com

tenebrio molitor

10/01/2025

ICAR-CMFRI Signs MoU with Bhairav Renderers for Insect Protein Fish Feed Technology

The MoU aims to transfer ICAR-CMFRI's innovative technology for producing fish feed using Black Soldier Fly Larvae. This collaboration seeks to provide sustainable, cost-effective feed solutions to Indian fish farmers.

krishijagran.com

hermetia illucens

03/01/2025

Proteina's sustainable insect protein secures EU support

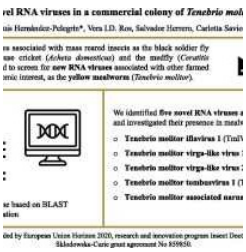
Egyptian Proteina Feeds has secured support from the European Bank for Reconstruction and Development and the EU for its insect-based protein. With the support, the company publicized it is expanding its value chain and producing an organic pet food product made from sustainable insect protein. The animal feed industry has long grappled with sustainability challenges; [...] Proteina's sustainable insect protein secures EU support ...

www.feedandadditive.com

hermetia illucens

Product - articles

Sources : HAL, Pubmed, BASE, MDPI, F100Research, Jounal of Insects as Food and Feed, ...



30/04/2025

Novel RNA viruses in a commercial colony of Tenebrio molitor - Hernández-Pelegrín et al.

Insect mass rearing for food and feed purposes is rapidly expanding in response to the current increase in protein demand. The mass reared insect stra...

www.sciencedirect.com

tenebrio molitor

30/04/2025

Comparative analysis of growth models for rainbow trout fed varying levels of fish meal replacement by black soldier fly meal - Yandi et al.

Abstract Black soldier fly (BSF), Hermetia illucens, is a promising protein source for aquafeeds, an alternative to fish meal. In this study, the Gompertz model, the Logistic model, and the von Bertalanffy model have been applied to determine the best diet to predict growth by time during the early life stage of rainbow trout (Oncorhynchus mykiss) fed with diets containing different levels of BSF meal. Fish were fed with a basal ...

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hermetia illucens

30/04/2025

Impact of hybrid drying on the drying kinetics, nutritional, physicochemical, functional, structural, and thermal properties of black soldier fly larvae - Lehmad et al.

Abstract Black soldier fly larvae (BSFL) are increasingly utilized as feed and food to enhance food security and meet global demand. This study examines the effects of Hybrid Solar-Electric Drying (HSED) on BSFL at four temperatures (40, 50, 60 and 70 °C), focusing on drying kinetics and various properties. Results show that higher drying temperatures significantly reduce drying time by up to 88%, driven by enhanced moisture diffusion ...

brill.com

hermetia illucens

30/04/2025

Mealworm (Tenebrio molitor) feed substrate waste: An alternative protein source for aquafeed production - Boonthong et al.

Abstract Mealworms (Tenebrio molitor) are edible insects typically used as feed for captive reptiles, fish and birds. However, the incorporation of mealworm feed substrate waste (FSW) in fish feed has not been fully investigated. The objective of this study was to evaluate the nutritional composition and in vitro digestibility of mealworm FSW. Mealworm larvae were reared on a substrate of commercial chicken feed. Triplicate samples ...

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tenebrio molitor

28/04/2025

Effects of butane-defatted black soldier fly larvae meal replace dietary fishmeal on growth, antioxidant capacity and intestine health of rainbow trout (Oncorhynchus mykiss) - Li et al.

With the increasing price of fishmeal, the quest for alternative protein sources has become increasingly imperative. Among the potential protein sourc...

www.sciencedirect.com

hermetia illucens

27/04/2025

Edible Insects in Pet Food: Does the Rearing and Processing Alter the Nutritional Value? - Spranghers et al.

Despite the legal approval, the use of edible insects in food for dogs and cats is still limited and there are still some fundamental questions before the widespread application will kick off. This r...

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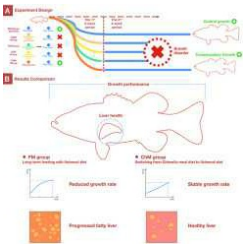

23/04/2025

Triggering compensatory growth by completely replacing fishmeal with novel protein sources in the diets of juvenile largemouth bass (Micropterus salmoides): Effects on growth performance and liver health - Wang et al.

To trigger compensatory growth (CG) with novel protein sources in juvenile largemouth bass (Micropterus salmoides) (initial weight: 4.73 ± 0.04 g), Ch...

www.sciencedirect.com

23/04/2025

Systematic review of the microbiological status of farmed and processed Tenebrio molitor: Insights on foodborne pathogens in food and feed applications - Yan et al.

Edible insects are gaining recognition as a sustainable, protein-rich source of food and feed, with microbiological food safety being a critical consi...

www.sciencedirect.com

tenebrio molitor

23/04/2025

Effects of inclusion of black soldier fly larvae on growth performance, relative organ weight, and meat quality of broiler chickens - Lee et al.

The objective of this experiment was to investigates effects of inclusion of black soldier fly larvae (BSFL) on growth performance, relative organ wei...

www.sciencedirect.com

23/04/2025

Changes in behaviour and serotonergic system of Atlantic salmon (Salmo salar) fry related to different levels of black soldier fly larvae meal inclusion in the diet: Exploring the use of nutritional enrichment for its use as positive welfare in aquaculture - Chivite-Alcalde et al.

Insects are gaining attention for its efficiency in converting low-value substrates into high-quality protein, aligning with principles of the circula...

www.sciencedirect.com

23/04/2025

Development of alternative feed with seed and insect meal for sustainable production of rainbow trout (Oncorhynchus mykiss) and quality fillets - Cortes-García et al.

Background Rainbow trout (Oncorhynchus mykiss) is a freshwater fish with an aquaculture industry widely distributed throughout the world, whose diet is based on fish meal (marine origin), with serio...

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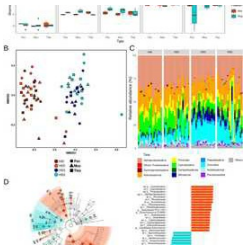
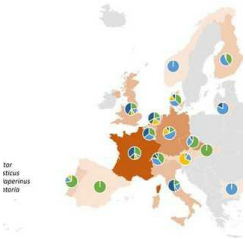


22/04/2025

Effect of graded inclusion of black soldier fly (Hermetia illucens, Linnaeus, 1758) pre-pupae meal in diets for gilthead seabream (Sparus aurata, Linnaeus, 1758) on gut microbiome and liver morphology - Basili et al.

Over the last decades, an insect meal has received great attention for finfish diets, due to its nutritional composition and low ecological footprint. In the present study, we assessed the response of gut microbiota composition and liver histology of gilthead seabream (Sparus aurata) fed four experimental diets including the black soldier fly (Hermetia illucens) meal (HI) used to replace 0 (HI0), 25 (HI25), 35 (HI35) and 50 (HI50) ...

link.springer.com



22/04/2025

Are Insect-Based Foods Healthy? An Evaluation of the Products Sold in European E-Commerce - Copelotti et al.

Over the past few years, edible insects have been recognised as potential “new” food sources in Western countries due to their sustainability and adaptability in the food production sector. To determine the distribution in Europe of insect-based food producers within each country, as well as the number and types of products, data from e-commerce were collected and analysed. The FoodEx2 classification was used to categorise the ...

www.mdpi.com

19/04/2025

Effects of live black soldier fly and yellow mealworm larvae supplementation on slaughter performance and meat composition of Muscovy ducks - Gariglio et al.

The aim of the present study was to assess the effects of dietary supplementation with live black soldier fly (BSF) and yellow mealworm (YMW) larvae on Muscovy duck slaughter performance, meat quality (pH, color, water holding capacity, and shear force), proximate composition, and fatty acid profile. A total of 126 female Muscovy ducks were split into three groups: control (commercial feed only), BSF (commercial feed + BSF larvae), and YMW (commercial feed + mealworm larvae). At 55 days of age, the slaughter weight and meat quality of ...

www.nature.com

hermetia illucens

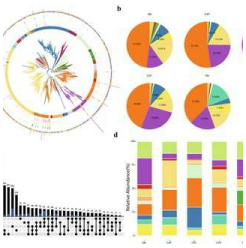
18/04/2025

Research note: High levels of lead and arsenic in imported dried black soldier fly larvae: implications for backyard poultry supplementation - Baxter et al.

Insects provide essential nutrition to poultry, however, the feedstock fed to the insects and the age and method of processing, can significantly impa...

www.sciencedirect.com

hermetia illucens



16/04/2025

Response patterns and community assembly processes of gut microbiota in grass carp subjected to various protein sources and their implications for growth and metabolism - Cai et al.

Feed nutrients are crucial in shaping the gut microbial community, especially for complex interactions. While much research focused on the impacts of dietary protein levels, exploration of protein sources remains insufficient. Accordingly, this study specifically investigated the effects of four protein sources [Clostridium autoethanolicum protein (CAP), cottonseed protein concentrate (CPC), Chlorella vulgaris meal (CVP), and Tenebrio ...

link.springer.com

14/04/2025

Yellow mealworm as an alternative to conventional plant- and animal-based protein sources in feedlot lambs' diets: Implications on blood parameters, growth and slaughter performance, carcass traits, and meat quality - Robles-Jimenez et al.

This study evaluates the effects of Tenebrio molitor meal (TMM) as an alternative to conventional plant-based (soybean meal, SBM) and animal-based (fi...

www.sciencedirect.com

tenebrio molitor

11/04/2025

Can a mixture of Hermetia illucens and Tenebrio molitor meals be feasible to feed broiler chickens? A focus on bird productive performance, nutrient digestibility, and meat quality - Biasato et al.

Hermetia illucens (HI) and Tenebrio molitor (TM) meals have widely been used in broiler chickens, but their mixture has never been tested. This study ...

www.sciencedirect.com

hermetia illucens | tenebrio molitor

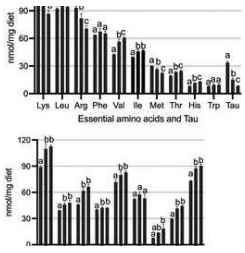
02/04/2025

Effects of dietary inclusion of black soldier fly larvae raised on kitchen waste on laying performance and egg quality in laying hens - Jiang et al.

This experiment aimed to investigate the effects of adding black soldier fly larvae (BSFL) raised on kitchen waste to the diet on the laying performan...

www.sciencedirect.com

hermetia illucens



31/03/2025

Protein and fatty acid assimilation from larvae of black soldier fly Hermetia illucens in diets for red seabream Pagrus major - Andoh et al.

A 42-day feeding experiment was conducted to assess the performance of red seabream when fed with black soldier fly larvae meal (BSFm). Diets were isocalorically designed with fishmeal or BSFm in ratios of 100:0 (group 1), 50:50 (group 2), and 22:78 (group 3). Group 1 exhibited a significantly higher specific growth rate (2.92% ± 0.22%/day) than group 3 (2.54% ± 0.22%/day), while group 2 (2.77% ± 0.21%/day) showed no significant ...

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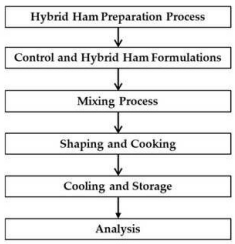
hermetia illucens



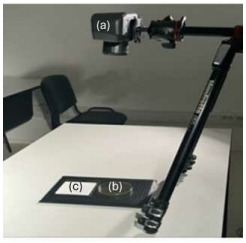
28/03/2025

Sustainable Meat Alternatives: Incorporation of Tenebrio molitor and Alphitobius diaperinus Powders into Pork-Based Hybrid Hams - Carvalho et al.

The increasing demand for sustainable meat alternatives has driven research into edible insects as a protein source. This study developed and characterized hybrid hams using pork meat with 10% of Tenebrio molitor, 10% of Alphitobius diaperinus, or 5% of A. diaperinus plus 5% of T. molitor powders. The hybrid hams were analyzed for color, texture, nutritional composition, amino acid profile, antioxidant activity, and consumer acceptance. ...

www.mdpi.com

tenebrio molitor



27/03/2025

First Insights into Macromolecular Components Analyses of an Insect Meal Using Hyperspectral Imaging - Oliveira da Silva et al.

The non-invasive nutritional analysis of feed through images captured by hyperspectral cameras represents an innovative and promising approach in the field of biotechnology. With this technology, it is possible to capture images at multiple wavelengths and identify unique spectral patterns associated with different molecular components, such as total fat and moisture. The technique is particularly valuable in biological environments, ...

www.mdpi.com

27/03/2025

Substitution of Poultry Fat with Black Soldier Fly (Hermetia illucens) Larvae Fat in Dog Diets: Effects on Digestibility, Palatability, Peroxidation of Dry Food, Immunity, Blood Biochemistry, and Faecal Characteristics of Adult Dogs - Kahraman et al.

This study evaluated the effects of partially or fully replacing poultry fat with black soldier fly larvae (BSFL) fat on faecal parameters, blood biochemistry, immune responses, nutrient digestibility, food preference, and lipid oxidation in dogs. A total of 18 adult Golden Retriever dogs (6 dogs per diet group) were subjected to a digestibility trial for 30 days. Three experimental diets were formulated: a control diet (6% poultry ...

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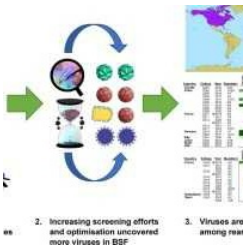
hermetia illucens



27/03/2025

High-throughput screening reveals high diversity and widespread distribution of viruses in black soldier flies (Hermetia illucens) - Pienaar et al.

Virus discovery in mass-reared insects is a growing topic of interest due to outbreak risks and for insect welfare concerns. In the case of black sold...

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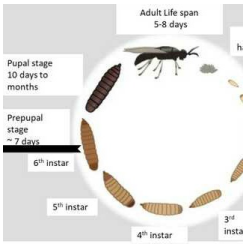
hermetia illucens



22/03/2025

Critical safety concerns in the production of black soldier Fly (Hermetia illucens) larvae in Africa - Mufungwe et al.

This review examined relevant literature on insect-based feed and food in Africa, focusing on the black soldier fly, Hermetia illucens, larvae (BSFL). Literature was systematically reviewed following the Preferred Reporting Items for Systematic and Meta-Analyses (PRISMA) guidelines. Only articles communicated in English, published up to March 2024, conducted in Africa, and relevant to microbiological, chemical, and physical hazards ...

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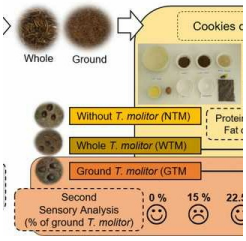
hermetia illucens



22/03/2025

Chrysodeixis includens as a potential source of protein and acceptance of cookies containing Tenebrio molitor - Pereira dos Santos Richards et al.

In the food industry, edible insects represent an innovative protein source. However, new protein sources and the development of insect-based products are particularly important in countries with minimal tradition of insect consumption. Therefore, the physicochemical properties and fatty acid profiles of Chrysodeixis includens, a potential new edible insect were investigated in comparison with Tenebrio molitor, which is commonly ...

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20/03/2025

Yellow mealworm (Tenebrio molitor): A rare cause of chronic urticaria - Tekcan et al.

This report presents a unique case of chronic urticaria (CU) caused by a food allergy to mealworm. A 10-year-old boy experienced daily itchy urticaria...

www.sciencedirect.com

20/03/2025

Effect of black soldier fly (Hermetia illucens L.) larvae meal on growth performance, carcass characteristics, meat quality, and cecal microbiota in broiler chickens - Saidani et al.

The current study was conducted to evaluate the effects of Black Soldier Fly (BSF) larvae meal in broiler chicken diets on growth performance, carcass charac...

www.frontiersin.org

hermetia illucens

19/03/2025

Black Soldier Fly Larvae Meal as a Sustainable Alternative to Fishmeal in Juvenile Swamp Eel Diets: Effects on Growth and Meat Quality - Nguyen et al.

The rising scarcity and cost of fishmeal due to overfishing and environmental challenges demand alternatives. Black soldier fly (Hermetia illucens) larvae (BSFL) meal, with its nutritional value, shows promise as a sustainable supplement for aquaculture species. This study evaluated the effects of BSFL meal supplementation on growth performance, survival, feed conversion efficiency, and meat quality in juvenile swamp eels (Monopterus ...

www.mdpi.com

hermetia illucens

19/03/2025

Mismatched menu: the incompatibility of adult black soldier flies as praying mantis feed - Klüber et al.

Praying mantises are known for their striking predatory behavior and are becoming increasingly popular with hobbyists and for scientific research. As general...

www.frontiersin.org

hermetia illucens

18/03/2025

GC–MS/MS–based multiresidue pesticide analysis in mealworm (Tenebrio molitor) larvae: Optimization of standard QuEChERS-based method to minimize matrix effects - Noh et al.

Given the unsuitability of the standard quick, easy, cheap, effective, rugged, and safe (QuEChERS)-based method for multiresidue pesticide analysis in...

www.sciencedirect.com

tenebrio molitor

16/03/2025

Regulation of serum reproductive hormones, gap junction proteins, and cytokine profiles in laying hens fed varying levels of expanded black soldier fly meal - Tajudeen et al.

This study examined the impact of expanded black soldier fly (EP-BSF) meal on laying hens' reproductive hormones, gap junction proteins, cytokines, an...

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hermetia illucens

15/03/2025

Yellow mealworm (Tenebrio molitor) meal replacing dietary fishmeal alters the intestinal microbiota, anti-oxidation and immunity of large yellow croaker (Larimichthys crocea) - Qu et al.

The present study investigated the impact of dietary fishmeal replacement with yellow mealworm (Tenebrio molitor) meal (TM) on the anti-oxidation, imm...

www.sciencedirect.com

tenebrio molitor

15/03/2025

The inclusion of insect meal from Hermetia illucens larvae in the diet of laying hens (Hy-line Brown) affects the caecal diversity of methanogenic archaea - Mahayri et al.

The effect of the dietary inclusion of Hermetia illucens larvae meal on the diversity of the methanogenic archaea in the caecum of laying hens (Hy-lin...

www.sciencedirect.com

hermetia illucens

14/03/2025

Review: A journey into the black soldier fly digestive system: From current knowledge to applied perspectives - Bruno et al.

Recent literature on the black soldier fly (BSF) confirms the deep interest in this species for the bioconversion of organic waste, including challeng...

www.sciencedirect.com

hermetia illucens

12/03/2025

Amino Acid Digestibility of Yellow Mealworm-Based Ingredients using the Precision-Fed Cecectomized Rooster Assay - Smola et al.

Abstract. Yellow mealworms (Tenebrio molitor) serve as an alternative protein source. Because the amino acid (AA) concentrations, AA digestibility, and pro

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tenebrio molitor

12/03/2025

Evaluation of nutritional values of defatted black soldier fly (Hermetia illucens) larvae meal using the precision-fed cecectomized rooster assay - Mioto et al.

Defatted black soldier fly larvae meal, derived from 2 substrates, showed high digestibility and comparable protein quality, emerging as a promising sustai

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hermetia illucens

11/03/2025

Intake, digestion, and rumen microbial impacts of black soldier fly larvae and frass provided as protein supplements to cattle consuming forage - Maggitt et al.

The growing insect agriculture industry has significant capacity to produce N rich larval biomass, which also creates a byproduct stream of larval frass an

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hermetia illucens

08/03/2025

Complementing the high soybean meal diet with black soldier fly larvae meal as a functional feed ingredient to improve the performance, nutrient profile, and gut health of rainbow trout, Oncorhynchus mykiss - Singha et al.

This study explores the use of black soldier fly (Hermetia illucens) larvae meal (BSFL) as a ‘functional feed ingredient’ in aquafeed formulations, ai...

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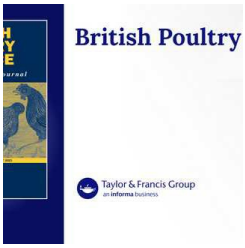
hermetia illucens



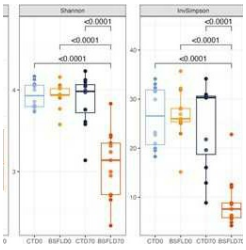
07/03/2025

The apparent metabolisable energy and ileal amino digestibility of black soldier fly (Hermetia illucens) pre-pupae meal for broiler chickens - Mahmoud et al.

1. The main objective of this study was to investigate black soldier fly (BSF) pre-pupae (BSFP) meal compared to soybean meal by evaluating its nutritional composition, apparent metabolisable energ...

www.tandfonline.com

hermetia illucens



05/03/2025

Effects of black soldier fly larvae on the fecal characteristics, skin and coat health markers, immune function, and oral health measures of healthy adult cats - Oba et al.

In this study, the effects of black soldier fly larvae (BSFL) on the serum chemistry, hematology, skin and coat health markers, fecal characteristics, immu

academic.oup.com

04/03/2025

Nutritional Properties of Selected Edible Insects - Tan et al.

This study aimed to determine the nutritional properties of selected edible insects as a potential future food. A total of eight species of edible insects, including the dubia roach (Blaptica dubia), super worm (Zophobas morio) larvae, locust (Locusta migratoria), silkworm (Bombyx mori) pupae, house cricket (Acheta domesticus), sago palm weevil (Rhynchophorus ferrugineus) larvae, black soldier fly (Hermetia illucens) larvae, and ...

www.mdpi.com

28/02/2025

Effects of dietary yellow mealworm Tenebrio molitor meal and selenium on the growth performance, digestive and absorptive enzyme activity, immune response, skin color, and muscle quality of large yellow croaker Larimichthys crocea - Qu et al.

The present study aimed to investigate the effects of increasing levels of yellow mealworm Tenebrio molitor (TM) meal as a replacement of dietary fish...

www.sciencedirect.com

tenebrio molitor

28/02/2025

The defatted black soldier fly meal (Hermetia illucens) improved the pathogen resistance and gut health of Nile Tilapia (Oreochromis niloticus) - Wang et al.

As a novel protein source, the black soldier fly (Hermetia illucens) possesses the potential to enhance fish health due to its high protein content, e...

www.sciencedirect.com

hermetia illucens

27/02/2025

Development of nutrient-rich cookies using black soldier fly (BSF) flour - Wrasiati et al.

Abstract Black soldier fly (BSF) larvae are known for their rich nutritional profile, particularly in protein, essential fatty acids, and micronutrients. Incorporating BSF larvae flour into food products offers a promising avenue to improve dietary intake. This research aimed to utilize the nutritional content of BSF larvae as food to prevent stunting by examining the effect of BSF larvae flour formulation on cookies characteristics ...

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hermetia illucens

27/02/2025

Improving formulation of innovative edible insect-based crispbread containing Tenebrio molitor or Acheta domesticus through sensory profiling and liking - Rocha et al.

Abstract One of the critical factors in increasing consumer acceptance of edible insects is the development of appropriate products that lead to satisfactory sensory experiences. This way, the negative associations with entomophagy can be hampered, and developed products can be more successfully integrated into consumers' diets. This research aimed to integrate consumers into the food product development process, achieving crispbread ...

brill.com

tenebrio molitor

26/02/2025

Impact of partially defatted black soldier fly larvae meal on coccidia-infected chickens: effects on growth performance, intestinal health, and cecal short-chain fatty acid concentrations - Yuan et al.

Background Black soldier fly larvae meal (BSFLM) stands out as a promising nutritional resource due to its rich bioactive substances and favorable protein profile. Nonetheless, its potential to mitigate coccidia infection in broilers remains uncertain. This study aimed to evaluate the impact of partially defatted BSFLM (pBSFLM) on growth performance, nutrient utilization, and intestinal health, focusing on morphology, immunology, ...

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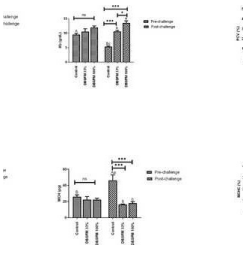
hermetia illucens



25/02/2025

Defatted black soldier fly (Hermetia illucens) diets improved hemato-immunological responses, biochemical parameters, and antioxidant activities in Streptococcus iniae-infected Nile tilapia (Oreochromis niloticus) - Abd El-Gawad et al.

Background Challenges of limited supply and increasing prices of fishmeal have driven the aquaculture nutritionists to seek alternative sustainable protein rich ingredients to keep manufacturing aquafeeds in a maintainable and cost-effective way. Black soldier fly, Hermetia illucenslarvae meal represent great potential as a sustainable alternative to fishmeal in aquafeeds. Methods Three replacement diets for fishmeal were prepared ...

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hermetia illucens

22/02/2025

Defatted black soldier fly larvae meal as a substitute of soybean meal in dairy cow diets - Braamhaar et al.

The replacement of soybean meal (SBM) with insect meal, e.g. black soldier fly larvae meal (BSFLM), as an alternative protein source in livestock feed...

www.sciencedirect.com

21/02/2025

Effects of fishmeal substitution with defatted black soldier fly larvae and soy protein meals on the growth, physio-biochemical responses, and immune-related gene expression of Atlantic salmon (Salmo salar) - Meesala et al.

A 12-week growth trial was conducted to evaluate the substitution of fishmeal (FM) with defatted black soldier fly larvae (BSFL) and soy protein (SOY)...

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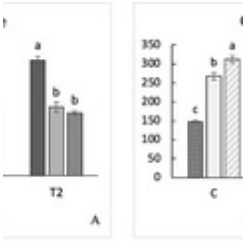
hermetia illucens



21/02/2025

New horizons in live and dehydrated black soldier fly larvae usage: Behavioral and welfare implications in “Bianca di Saluzzo” cockerels - Bongiorno et al.

The literature on poultry welfare and behavior reports numerous promising effects derived from the administration of live or dehydrated black soldier fly larvae (BSFL) as environmental enrichment; however, their use in slow-growing male chickens has never been evaluated. To fill this gap, we divided a total of 144 Bianca di Saluzzo male chicks aged 39 days old into three experimental groups (six replicates, eight birds/replicate): ...

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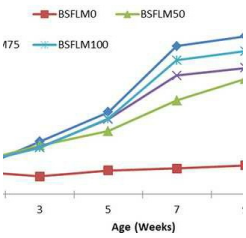
hermetia illucens



19/02/2025

Black soldier fly (Hermetia illucens) larvae improve growth performance and flesh quality of African catfish (Clarias gariepinus) - Hervé et al.

High cost and scarcity of feed ingredients have continued to challenge the aquaculture. This present study assessed the potential of black soldier fly (BSF, Hermetia illucens L.) larvae meal (BSFLM) as a sustainable alternative source of animal protein in the diet of African catfish (Clarias gariepinus), a species widely farmed in Cameroon for its breeding potential and economic. Five diet formulations: two control diets with 100% ...

link.springer.com

19/02/2025

Insect Meal (Tenebrio molitor) Has High Nutrient Digestibility for Newly Weaned Piglets - Pereira et al. - 2025 - Animal Science Journal - Wiley Online Library

This study aimed to evaluate the inclusion of insect larvae meal (Tenebrio molitor) on the apparent total digestibility of dry matter (DM), gross energy (GE), ether extract (EE), crude protein (CP), ...

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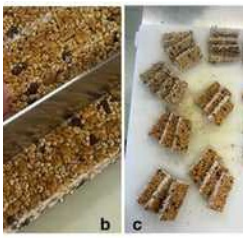
tenebrio molitor



18/02/2025

Edible Insect Meals as Bioactive Ingredients in Sustainable Snack Bars - Coppola et al.

Insect metabolites are known for their preservative potential, but the time-consuming and unsustainable extraction process compromises their transferability. This study aimed to identify user-friendly solutions based on the use of insect meals that could improve microbiological safety as well as consumer acceptability. In this regard, the antimicrobial activity of Alphitobius diaperinus and Tenebrio molitor meals against surrogate ...

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18/02/2025

Impact of High Hydrostatic Pressure on the Physicochemical Characteristics, Functional Properties, Structure, and Bioactivities of Tenebrio molitor Protein - Zhang et al.

Impact of high hydrostatic pressure on the physicochemical characteristics, functional properties, structure, and bioactivities of Tenebrio molitor protein.

onlinelibrary.wiley.com

11/02/2025

Evaluation of the possibility of black soldier fly larvae as a fishmeal substitute on broiler breeder - Chang et al.

Abstract This study investigated the effect of processed forms (defatted or hydrolyzed) of black soldier fly larvae (Hermetia illucens L., BSFL) as a protein substitute on broiler breeders. A total of 54 arbor acre broiler breeders (25-week-old; Average initial body weight = 3.39 ± 0.16 kg) obtained from a local hatchery were used in this study. All birds were assigned to three dietary treatments using a randomized complete block ...

brill.com

hermetia illucens

10/02/2025

Growth performance and meat quality of medium-growing chickens fed with live black soldier fly larvae - Tognoli et al.

The study aims to evaluate live black soldier fly larvae (BSFL) supplementation in medium-growing chicken's diet, the effects on growth and slaughter performance, and quality of meat. A total of 90...

www.tandfonline.com

hermetia illucens

08/02/2025

Black soldier fly larvae oil can partially replace fish oil in the diet of the juvenile mud crab (Scylla paramamosain) - Yang et al.

An 8-week feeding trial was conducted to investigate the effects of replacing dietary fish oil (FO) with black soldier fly larval oil (BSFO) on growth...

www.sciencedirect.com

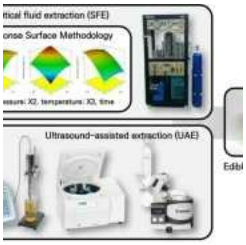
06/02/2025

Perspectives on the adoption of black-soldier fly larvae for animal feed among livestock farmers in Sub-Saharan Africa - Akonkwa Nyamuhirwa et al.

1 Introduction Insufficient protein consumption is Africa's primary source of malnutrition as animal protein is too expensive for most people (Schönfeldt and Hall, 2012; Moughan, 2021). While the protein requirement is 0.7 g per kilogram body weight per day, the consumption level in most Sub-Saharan African (SSA) countries falls under this threshold as most consumers cannot afford meat products (Schönfeldt and Hall, 2012; OECD-FAO, 2021; Font-i-Furnols, 2023). The low consumption level is due to the high cost of meat products primarily ...

www.frontiersin.org

hermetia illucens



05/02/2025

Optimization and comparative analysis of quality characteristics and volatile profiles in edible insect oils extracted using supercritical fluid extraction and ultrasound-assisted extraction methods - Nam et al.

Edible insects are gaining global attention as a sustainable alternative source. In this study, insect oils were extracted using supercritical fluid e...

www.sciencedirect.com

05/02/2025

Microbial safety of industrially reared Hermetia illucens larvae and frass: bacterial dynamics and prevalence of antibiotic resistance genes - Ravoitytė et al.

Abstract The larvae of the black soldier fly (BSFL) can efficiently convert food waste into valuable biomass. They are also an alternative source of fat, protein, and chitin, but little is known about the total microbiota of the whole BSFL and its impact on the microbiological safety of food and feed. This study was conducted to determine bacterial microbiota dynamics of the whole BSFL and frass residues during the industrial rearing ...

brill.com

hermetia illucens

04/02/2025

Comparative evaluation of Acheta domesticus and Hermetia illucens as alternative protein sources for the growth, health, and meat quality of the broiler - Mustafa et al.

1 Introduction Soybean meal (SBM) and fish meal (FM) are the predominant protein sources in poultry feed. Still, there is limited land available worldwide for soybean cultivation. Overexploitation of marine resources has led to a significant decline in small pelagic forage fish, which are critical for producing FM and fish oil (Veldkamp et al., 2022). Moreover, the increasing expenses associated with these traditional protein sources posed a threat to the sustainable future of the poultry industry (McMichael and Bambrick, 2005). Furthermore, ...

www.frontiersin.org

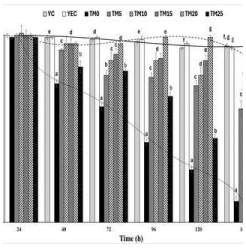
hermetia illucens

02/02/2025

Evaluation of nutritional value and quality of aquafeed ingredients for Malabar snapper (Lutjanus malabaricus) - Ngoh et al.

Fish meal is considered the benchmark for aquafeed ingredients, but its finite supply and rising demand necessitate exploring alternative protein sour...

www.sciencedirect.com



02/02/2025

Mealworm larvae promote Artemia franciscana metanauplii nutritional status and survival against marine aquaculture pathogens - Touraki et al.

Mass culture of Artemia sp. requires suitable feed, commonly microalgae, the production of which is a high-cost process. Moreover, in marine aquaculture Artemia sp. enrichment protocols are imperative to increase the content in the essential n-3 highly unsaturated fatty acids (HUFA), required for marine fish. The insect Tenebrio molitor appears as a sustainable alternative protein source for aquaculture feeds. In this study, the ...

link.springer.com

tenebrio molitor

01/02/2025

Liquid Chromatography-Tandem Mass Spectrometric (LC-MS/MS) Determination of Allergenic Proteins in Edible Flour Derived from Yellow Mealworms - Papastavropoulou et al.

Entomophagy offers significant benefits but also poses allergen risks. This study examined the presence of allergenic proteins in freeze-dried yellow mealworm powder using LC-MS/MS with electrospra...

www.tandfonline.com

01/02/2025

Black Soldier Fly Meal as a Gastrointestinal Tract Microbiota Remodelling Factor: A New Natural and Sustainable Source of Prebiotic Substances for Fish? - Rawski et al.

The microbiota of the gastrointestinal tract (GIT) plays a crucial role in the development, lifespan, physiology, barrier functions and immunity against pathogens in fish. One of the significant caus...

onlinelibrary.wiley.com

hermetia illucens

30/01/2025

Digestion, faeces microbiome, and selected blood parameters in dogs fed extruded food containing Black soldier fly (Hermetia illucens) meal - Kara et al.

The aim of this study was to determine the effects of using black soldier fly (Hermetia illucens) (HI) at 0% (HI0), 7.5% (HI75) and 15% (HI150) larva meal instead of chicken meal in extruded dog fo...

www.tandfonline.com

hermetia illucens

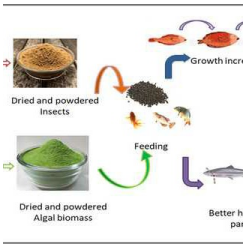
29/01/2025

Yellow mealworm (Tenebrio molitor) meal in diets of grass carp (Ctenopharyngodon idellus): Effects on growth performance, antioxidant capacity, immunity, intestinal morphology, and intestinal microbiota - Yang et al.

The impacts of substituting dietary soybean meal (SBM) with yellow mealworm meal (YMM) were investigated during a 56-day feeding trial on growth, anti...

www.sciencedirect.com

tenebrio molitor



22/01/2025

Waste not, want not: unlocking the innovative potential of organic and eco-friendly insect and algal resources for future aquaculture - Debbarma et al.

The aquaculture industry urgently requires sustainable protein sources to address the environmental, economic, and ethical challenges of conventional fishmeal. Rising feed costs, particularly for protein-rich ingredients, highlight the need for cost-effective, high-quality, and resource-efficient alternatives. Insect-based feeds, such as black soldier fly (BSF) larvae, and microalgae have emerged as promising solutions. BSF larvae ...

link.springer.com

22/01/2025

Black soldier fly larvae oil as an alternative oil source in diets for genetically improved farmed tilapia (GIFT, Oreochromis niloticus) - Yuan et al.

Abstract The black soldier fly oil (BSFO) is a promising dietary oil for aquatic animals due to its remarkable fatty acid profile. This study aimed to evaluate the feeding value of BSFO as an alternative oil source for genetically improved farmed tilapia (GIFT, Oreochromis niloticus), by investigating the growth performance, flesh quality, and health status of the experimental fish. Six iso-nitrogenous (35%) and isolipid (6%) diets ...

brill.com

20/01/2025

Black soldier fly larvae oil downregulated gene expression related to fat metabolism of broilers fed low protein diet - Al Anas et al.

Feeding low crude protein (LCP) diets supplemented with crystalline amino acids improves environmental and welfare parameters of broilers. However, in...

www.sciencedirect.com

hermetia illucens

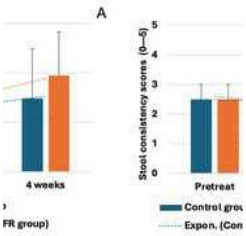
18/01/2025

The effect of processing on the nutritional values of yellow mealworm and Jamaican field cricket - Lampová et al.

Abstract Despite extensive research on the nutritional value of edible insects, there is insufficient data on how processing methods affect their chemical composition. In this study, our objective was to assess the effects of boiling, roasting, oven drying, and microwave heating on the nutritional value of insects euthanized via blanching or freezing. Results indicated that both the methods of killing and culinary treatment sig...

brill.com

tenebrio molitor



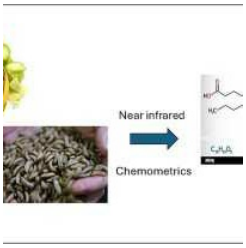
17/01/2025

Black Soldier Fly (Hermetia illucens) Larvae as a Protein Substitute in Adverse Food Reactions for Canine Dermatitis: Preliminary Results Among Patients - Srifawattana et al.

Can black soldier fly (BSF) larvae be a protein substitute for managing adverse food reactions (AFRs) in dogs, specifically those with dermatitis? We evaluated BSF larvae's safety, tolerance, and effectiveness as a novel protein source in dogs with AFRs. Sixteen dogs, including eight healthy controls and eight diagnosed with AFRs, were fed a diet containing BSF larvae for four weeks. Skin conditions, including dermatological lesions ...

www.mdpi.com

hermetia illucens



16/01/2025

A feasibility study on the use of near infrared spectroscopy to predict fatty acid concentration in intact black soldier fly reared in different waste streams - Alagappan et al.

The black soldier fly larvae (BSFL) are well known to utilise a wide variety of organic waste streams, delivering a product rich in protein (30–50%) a...

www.sciencedirect.com

16/01/2025

Unraveling the Potential of Black Soldier Fly Larvae as a Sustainable Protein Source for Nile Tilapia Production in Diverse Aquaculture Systems - Munguti et al.

Aquaculture plays a critical role in global food security, with Nile tilapia (Oreochromis niloticus) recognized for its adaptability and robust growth. However, traditional feeds, heavily reliant on ...

onlinelibrary.wiley.com

hermetia illucens

10/01/2025

Inclusion of Black Soldier Fly Larval Oil in Ruminant Diets Influences Feed Consumption, Nutritional Digestibility, Ruminal Characteristics, and Methane Estimation in Thai-Indigenous Steers - Prachumchai et al.

The objective of this study was to examine the impact of black soldier fly larval oil (BSFO) on feed consumption, nutritional digestibility, ruminal characteristics and methane (CH4) estimation in Th...

onlinelibrary.wiley.com

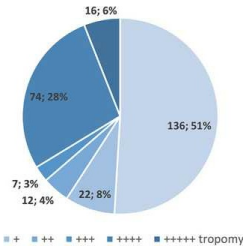
10/01/2025

In vitro and in vivo investigations on the use of yellow mealworm (Tenebrio molitor) as a novel protein feed ingredient for fattening lambs - Robles-Jimenez et al.

The quest for novel, alternative, and sustainable protein feed sources, including insects, has gained attraction by the feed industry. Here, two exper...

www.sciencedirect.com

tenebrio molitor



09/01/2025

IgE-based analysis of sensitization and cross-reactivity to yellow mealworm and edible insect allergens before their widespread dietary introduction - Emilia et al.

The European Commission authorized the use of dried yellow mealworm (Tenebrio molitor - TM) as a food ingredient under Regulation EU 2021/882. As TM emerges as an important allergen source, sensitization and allergy to TM in various populations need investigation. The aim of this study was to assess the incidence of sensitization to TM before its introduction as a food ingredient in Poland, as well as checking the occurrence of ...

www.nature.com

tenebrio molitor

09/01/2025

Flies and beetles-mediated transmission of pathogens in domestic pigs: a systematic review - Makovska et al.

Abstract The presence of flies and beetles in pig farms is common and raises concerns about their potential role in pathogen transmission. These concerns become even more significant when live insect larvae are used as animal feed. If not fully consumed by pigs, the larvae may remain on the farm, develop into adults, and thereby pose health risks. In order to implement effective biosecurity measures on farms, it is important to ...

brill.com

07/01/2025

Enhancing Meat Quality and Nutritional Value in Monogastric Livestock Using Sustainable Novel Feed Ingredients - Prates

This study explores the potential of novel feed ingredients for monogastric animals, such as pigs and poultry, to enhance meat quality and nutritional value while reducing the environmental footprint of production. Innovative feed options like black soldier fly larvae, Schizochytrium microalga, Laminaria seaweed, fermented soybean hulls, fortified flaxseed and grape pomace have significantly improved meat quality and nutritional ...

www.mdpi.com

07/01/2025

Nutritional value of black soldier fly larvae oil in calf milk replacers - Quigley et al.

The list of standard abbreviations for JDS is available at adsa.org/jds-abbreviations-24. Nonstandard abbreviations are available in the Notes.

www.journalofdairyscience.org

hermetia illucens

Industrial applications - media

Sources : mainstream media, regulatory sources, institutionnal, company,..

28/04/2025

New Report: Insect protein could be 13.5 times worse for climate than soy

Commissioned by the UK Government, a new Life Cycle Assessment (LCA) reveals that for 13 out of 16 main environmental impact categories, insect meal may have a higher impacts than the established alternatives such as fish meal and soybean meal. Up to one fifth of the world’s greenhouse gas emissions derive from meat production, the [...] New Report: Insect protein could be 13.5 times worse for climate than soy yazısı ilk önce Feed ...

www.feedandadditive.com

23/04/2025

Insects as feed won't lead to sustainable food systems, government-funded study shows

A new study commissioned by the UK Department of Environment, Agriculture and Rural Affairs found insect protein to have a much higher environmental impact that the animal feed it seeks to replace, and concluded that insects are “not the current solution to decarbonising the animal feed industry."

www.eurogroupforanimals.org

23/04/2025

Why insect protein is creating a buzz in Brazil

Insects are a future source of sustainable livestock feed and Brazil is an emerging site of investment. Brazil’s entry into insect protein is only just beginning but with scaling, it could help drive greener global food systems. A boost to Brazil’s insect sector Brazil’s bioeconomy is best known for its conventional agricultural exports like coffee [...] The post Why insect protein is creating a buzz in Brazil appeared first on ...

worldbiomarketinsights.com

15/04/2025

Farmers uncover surprising potential in insect waste for growing essential crops: 'It's exciting for so many reasons'

"Ultimately, at its core, we cannot survive without insects." Farmers uncover surprising potential in insect waste for growing essential crops: 'It's exciting for so many reasons' first appeared on The Cool Down.

www.thecooldown.com

26/03/2025

UKEIA calls for action on UK’s insect protein regulations

Pointing out that the UK lags behind other countries in the approval and use of insect-based proteins, the UK Edible Insects Association (UKEIA) has invited anyone with an interest in the alternative proteins industry to join its collective responses against the government regulations on the issue. The UK Edible Insect Association (UKEIA) has called on [...] UKEIA calls for action on UK’s insect protein regulations yazısı ilk önce ...

www.feedandadditive.com

20/03/2025

Central Europe’s largest insect protein production plant launched in Hungary

Hungary’s first industrial-scale insect protein plant began operations in Üllő in December 2024, where around 2 billion black soldier fly larvae are raised and processed in 12-day cycles. The industrial The post Central Europe’s largest insect protein production plant launched in Hungary first appeared on Trademagazin.

trademagazin.hu

10/03/2025

Ÿnsect’s Financial Struggles Raise Questions About the Future of Insect Protein in Swine Feed - Swineweb.com

Ÿnsect’s Financial Struggles Raise Questions About the Future of Insect Protein in Swine Feed Swineweb.com

consent.google.com

20/02/2025

Insect protein startup nsect prepares to sell for parts

French insect protein startup Ÿnsect is preparing to sell off parts of its business after failing to secure the funding needed to scale into industrial production, a source close to the company tells Sifted.The company — which has raised over $600m to date — farms beetles and transforms them into protein ingredients that can be used to create food for animals and humans. In 2020 Ÿnsect unveiled an ambitious 45k square metre industrial ...

sifted.eu

19/02/2025

We Must Invest in Europe’s Protein Independence – International Platform of Insects for Food and Feed, Brussels

Vision for Agriculture and Food: We Must Invest in Europe’s Protein The European Commission has just published its Vision for Agriculture and Food. Below you can find IPIFF’s take on the strategic direction this vision must adopt. Independence Administrative burdens and financing bottlenecks are drowning innovative European agri-food SMEs. If we want farmers to actively...

ipiff.org

18/02/2025

UK sees growing interest in insect protein sector

The UK Edible Insect Association believes that 2025 will be the year alternative protein goes mainstream. Preparing for the Nest 1.0 – Farmed Insect Protein Conference to be held on 24-25 April 2025, the association announced that it has increased its membership by 30% ahead of the conference. The UK Edible Insect Association (UKEIA) has [...] UK sees growing interest in insect protein sector yazısı ilk önce Feed & Additive Magazine ...

www.feedandadditive.com

02/02/2025

Future of farming: Insect waste reshapes soil health - Earth.com

Future of farming: Insect waste reshapes soil health Earth.com

consent.google.com

02/02/2025

Future of farming: Insect frass reshapes soil health - Earth.com

Insect frass turns waste into a powerful organic fertilizer, boosting soil health and sustainability in farming.

www.earth.com

30/01/2025

Insect Frass Boosts Soil Health as Fertilizer - Farms.com

Insect Frass Boosts Soil Health as Fertilizer Farms.com

consent.google.com

28/01/2025

World’s largest insect farm: Ground broken - All About Feed

World’s largest insect farm: Ground broken All About Feed

consent.google.com

16/01/2025

U.S. military used as testing ground for Bill Gates’ INSECT PROTEIN agenda

(NaturalNews) Bill Gates and his allies are pushing insect protein as an alternative food source, raising concerns over traditional food systems. The Gates...

www.naturalnews.com

Industrial applications - articles

Sources : HAL, Pubmed, BASE, MDPI, F100Research, Jounal of Insects as Food and Feed, ...

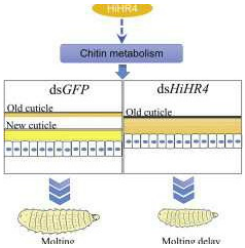
30/04/2025

Fillers at the end of processing improve instantaneous death via grinding for farmed yellow mealworm larvae (Tenebrio molitor; Coleoptera: Tenebrionidae) - Zacarias et al.

Abstract Three hundred billion or more yellow mealworms (Tenebrio molitor; Coleoptera: Tenebrionidae) are reared each year as food and feed. Instantaneous, and thus humane, death may be achieved for farmed insect larvae through the use of grinding/shredding. However, species-specific guidance is needed to create standard operating procedures that ensure a high likelihood of instantaneous death for each insect species. Further, ...

brill.com

tenebrio molitor



29/04/2025

HiHR4 regulates chitin metabolism during molting of Hermetia illucens - Dong et al.

The black soldier fly (Hermetia illucens) as a model bio-converter insect, is increasingly used in feed formulation and as a fertilizer source. Its gr...

www.sciencedirect.com

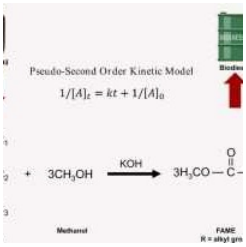
hermetia illucens

29/04/2025

Hermetia illucens-Derived Chitosan: A Promising Immunomodulatory Agent for Applications in Biomedical Fields - Fusco et al.

Chitosan, renowned for its important biological properties, is a valuable pharmaceutical excipient for different therapeutic approaches. Currently, the demand for the biopolymer on the market is growing, and, for this reason, it is important to biologically characterize the biopolymer produced from an alternative source to crustaceans, specifically the bioconverter insect Hermetia illucens. In this work, insect chitosan, yielded via heterogeneous and homogeneous deacetylation from larvae, pupal exuviae, and adults, was studied as an im...

pubs.acs.org



28/04/2025

Kinetics-based activation energy of one-step optimized transesterification in producing quality biodiesel from black soldier fly larvae oil - Ng et al.

Black soldier fly (BSF; Hermetia illucens), is an appealing solution towards organic waste reduction, and biodiesel production owing to its high oil c...

www.sciencedirect.com

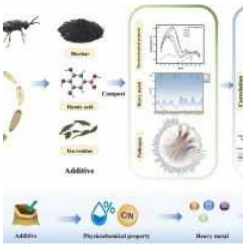
hermetia illucens

25/04/2025

An assessment of vegetable production constraints, trait preferences and willingness to adopt sustainable intensification options in Kenya and Uganda - Okoma et al.

1 Introduction Global population increase, limited land for agriculture, and ongoing climate change require sustainable methods for food production to boost productivity without further environmental degradation (United Nations, 2021; Kumar et al., 2022). In sub-Saharan Africa (SSA), agriculture is predominantly rain-fed, which accounts for 97% of total farmland, making crop production and food security highly vulnerable to seasonal variations in precipitation and temperature stress (Kotir, 2011). In SSA, land degradation through soil ...

www.frontiersin.org



23/04/2025

Assessment of the combined response of heavy metals and human pathogens to different additives during composting of black soldier fly manure - Wang et al.

The bioconversion of black soldier fly (BSF) is a new model of livestock manure resourcing. However, the biochemical properties of BSF manure are unst...

www.sciencedirect.com

hermetia illucens

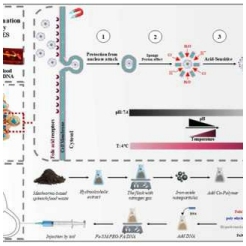
23/04/2025

The synergistic extract of Zophobas atratus and Tenebrio molitor regulates neuroplasticity and oxidative stress in a scopolamine-induced cognitive impairment model - Tran et al.

1 Introduction As the average global lifespan continues to increase, the prevalence of neurodegenerative diseases, such as Alzheimer's (AD) and Parkinson's disease (PD), along with age-related cognitive and memory impairments, is also increasing (Agnihotri and Aruoma, 2020). Patients with AD often experience progression from early memory impairment to more complex functional disorders, including language deficits, dementia, vi...

www.frontiersin.org

tenebrio molitor



22/04/2025

A novel approach in using insect-based spinach-food waste for gene targeting to cancer tissues - Majd-Marani et al.

In our study, we prepared Fe3O4 nanoparticles (NPs) using food waste extract of Mealworm (Tenebrio molitor) larvae fed spinach (Spinacia oleracea), which is rich in iron. A coating was applied to Fe3O4 NPs containing hyperbranched spermine-polyethylene glycol-folic acid (FHSPF) and spermine-polyethylene glycol-folic acid (FSMPF). Polymer was loaded with siRNA or DNA. DLS1, H-NMR, FTIR, EDX, Zeta potential and TEM were used to analyze ...

www.nature.com

tenebrio molitor

21/04/2025

Obtention and Characterization of Chitosan from Exuviae of Tenebrio molitor and Sphenarium purpurascens - Marín-Morales et al.

Chitosan is a versatile biopolymer with applications in various industries due to its biocompatibility and biodegradability. While crustacean shells are the primary source of chitosan, the extraction process can be environmentally taxing. This study focuses on evaluating chitosan from Tenebrio molitor and Sphenarium purpurascens, two insect species that offer a more sustainable alternative and require fewer resources for cultivation and produce large amounts of chitin-rich biomass. The acid–alkali method was applied using three experimental ...

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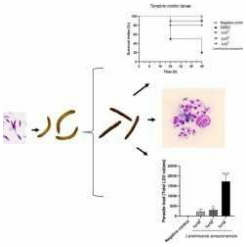
tenebrio molitor



16/04/2025

Yellow mealworm beetle (Tenebrio molitor) larvae as an alternative model for antileishmanial drug evaluation - de Moraes Alves et al.

Leishmaniasis is zoonotic disease caused by parasites of the genus Leishmania. Available treatments are limited and are associated with a range of adv...

www.sciencedirect.com

tenebrio molitor

16/04/2025

Harnessing Black Soldier Fly Larvae for Sustainable Biofuel Production: A Review of Global Research Trends and Future Directions - Odoi-Yorke et al.

The growing global demand for sustainable energy and effective waste management solutions has increased interest in innovative biofuel production methods. This study analyzes global research trends i...

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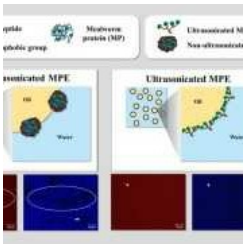
hermetia illucens



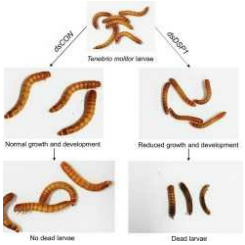
14/04/2025

Effects of ultrasound-induced structural modifications on the emulsifying properties of Tenebrio molitor proteins - Jang et al.

Ultrasonication has emerged as a promising technique for modifying physicochemical properties of proteins, enhancing their functionality in food appli...

www.sciencedirect.com

tenebrio molitor



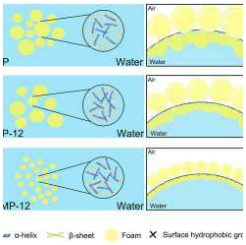
12/04/2025

Knockdown of Dorsal switch protein 1 Effect on Growth, Development, and survivability of Tenebrio molitor (Coleoptera: Tenebrionidae) - Mollah et al.

Dorsal switch protein 1 (DSP1) of insects and high mobility group box 1 (HMGB1) protein of vertebrates are homologous. Both HMGB1 and DSP1 act as dama...

www.sciencedirect.com

tenebrio molitor



12/04/2025

Effect of combined pH-Shifting and high-intensity ultrasound treatment on the structural, functional, and foaming properties of Tenebrio Molitor Protein - Huang et al.

With the development of the food industry and the increasing variety of emerging foods, the foaming properties of proteins have gained attention in th...

www.sciencedirect.com

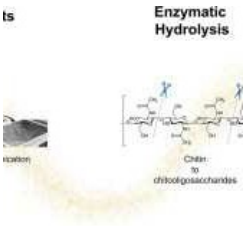
11/04/2025

Transformations of Head Structures During the Larval Development of the Black Soldier Fly Hermetia illucens (Stratiomyidae, Diptera) - Fabian et al.

The black soldier fly (Hermetia illucens) has seven larval instars. Drain channels of the digestive system, metacephalic rods, and the cephalic musculature are described for the 1st time. Profound ch...

onlinelibrary.wiley.com

hermetia illucens

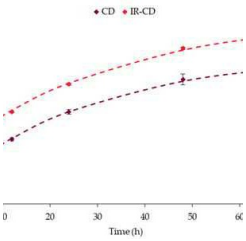


11/04/2025

Evaluating physical pre-treatment methods for improving insect chitin hydrolysis using Streptomyces griseus chitinase - Pedrazzani et al.

Chitin and particularly its derivatives, chitosan and chitoligosaccharides (COS), are gaining interest as highly functional biopolymers with many appl...

www.sciencedirect.com



08/04/2025

Effect of Drying Method on Selected Physical and Functional Properties of Powdered Black Soldier Fly Larvae - Bogusz et al.

This research aimed to assay the impact of convective drying (CD) or infrared–convective (IR–CD) drying methods on the physical and techno-functional properties, FTIR spectra, and mathematical modeling of adsorption kinetics of black soldier fly larvae powders. By using convective drying, insect powder exhibited higher water content and water activity but lower hygroscopicity than powder dried with the infrared–convective method. ...

www.mdpi.com

hermetia illucens

08/04/2025

Water Transport and Enzyme Recycling in Tenebrio molitor Midgut: Insights From Transcriptomics, Proteomics, and In Vivo Inhibition Assays - Barroso et al.

Countercurrent water flux moves from the posterior to the anterior midgut. Furosemide-sensitive symporters (NKCC1 and KCC), expressed in the water-transporting regions, might regulate this process. T...

onlinelibrary.wiley.com

tenebrio molitor

06/04/2025

Odor nuisance, environmental impact and health risk of priority-controlled VOCs generated from three decentralized aerobic biological modes in treating rural perishable waste - Zhang et al.

Utilization of perishable waste has emerged as the pivotal factor in enhancing the quality and efficiency of garbage classification in rural regions of China. Nevertheless, the operation of small-scale decentralized aerobic biological treatment facilities in rural areas will inevitably result in the emission of malodorous volatile organic compounds (VOCs). In this study, VOCs emission characteristics of three typical decentralized ...

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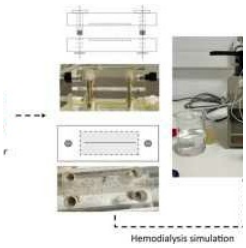

04/04/2025

Exploring the potential of mealworm chitosan for hemodialysis applications - Martingo et al.

This study introduces a sustainable and efficient alternative to traditional chitosan sources derived from crustaceans, exploring the extraction and a...

www.sciencedirect.com

tenebrio molitor

01/04/2025

Variation in strain performance and estimates of heritability of body size indicate considerable potential for genetic improvement of the black soldier fly (Hermetia illucens) - Generalovic et al.

This study investigates genetic variation and heritability in the black soldier fly (Hermetia illucens), a key species for sustainable protein production. Using a standardised split-brood design, we ...

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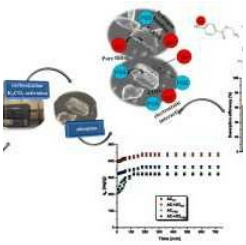
hermetia illucens



25/03/2025

Adsorption of ethyl-4-hydroxybenzoate and poly(sodium 4-styrenesulfonate) on activated carbons from Hermetia illucens pupal casings: characterization and regeneration - Bazan-Wozniak et al.

A study was conducted to investigate the adsorption mechanism of ethyl-4-hydroxybenzoate and poly(sodium 4-styrenesulfonate) on activated carbons prod...

www.sciencedirect.com

24/03/2025

Correlated response to selection for increased body weight on fecundity in Hermetia illucens - Shrestha et al.

Selection for economically interesting traits like body weight can play a crucial role in lowering production costs in black soldier fly, Hermetia illucens (Diptera: Stratiomyidae). However, how sele...

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hermetia illucens

24/03/2025

Aqueous extracts and protein concentrate of Tenebrio molitor prolong the lifespan of Caenorhabditis elegans under environmental stress conditions - Anusha et al.

Background Tenebrio molitor, commonly known as the mealworm, is globally accepted and recognized as an edible insect with a high nutritional profile and potential health benefits. Mealworms are sust...

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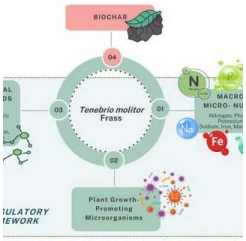
tenebrio molitor



19/03/2025

Tenebrio molitor Frass: A Cutting-Edge Biofertilizer for Sustainable Agriculture and Advanced Adsorbent Precursor for Environmental Remediation - Verardi et al.

The projected growth of the global population to over 10 billion by 2080 necessitates groundbreaking sustainable agricultural solutions that enhance productivity while mitigating environmental impacts. Tenebrio molitor frass (TMF), derived from larval excrement and exuviae, has emerged as a promising organic fertilizer. Enriched with macro- and micronutrients, TMF enhances soil functions through microbial communities that promote ...

www.mdpi.com

tenebrio molitor

17/03/2025

Black soldier flies as a latent driver to attaining selected SDGs in a developing country context- the case of Uganda - Kasima et al.

In developing countries, minimal progress has been made towards the attainment of Sustainable Development Goals (SDGs). This is because of low investment in innovations towards this endeavor. In th...

www.tandfonline.com

hermetia illucens

17/03/2025

Black soldier frass valorization into low-cost residual biofertilizer conversion process and its effectiveness in foliar and soil applications - Elguera et al.

This study evaluated the potential of a liquid biofertilizer derived from Hermetia illucens frass for the sustainable cultivation of Phaseolus vulgari...

www.sciencedirect.com

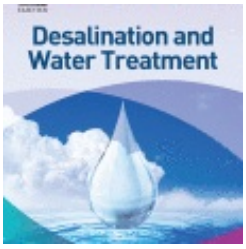
hermetia illucens

16/03/2025

The latest insights and perspectives on chitosan supplementation driving ruminant feed efficiency and sustainability - Piboonkunsamlit et al.

Ruminant production faces challenges such as low feed efficiency and methane emissions, contributing to environmental issues. Feed additives, particul...

www.sciencedirect.com



15/03/2025

Hermetia illucens pupae casings and biogas slurry activated carbon electrodes for Cd2 + removal from aqueous solutions using capacitive deionization - Panja et al.

This study examined capacitive deionisation's effectiveness for recovering Cd2+ from water using novel carbon-based electrodes derived from Hermetia i...

www.sciencedirect.com

hermetia illucens

15/03/2025

Tenebrio molitor proteins and peptides: Cutting-edge insights into bioactivity and expanded food applications - Ma et al.

Tenebrio molitor (T. molitor) is gaining attention as a promising alternative food source due to its ease of cultivation, high reproductive rate, and ...

www.sciencedirect.com

tenebrio molitor

13/03/2025

Fetal bovine serum substitution efficacy of mealworm (Tenebrio molitor) protein hydrolysates and its physicochemical properties - Lee et al.

Fetal bovine serum (FBS) is widely used in cell culture media but raises ethical, cost, and environmental concerns. This study hypothesized that mealw...

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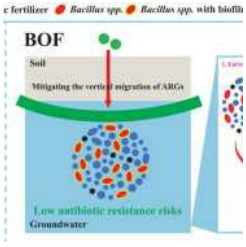
tenebrio molitor



12/03/2025

Mitigating the vertical migration and leaching risks of antibiotic resistance genes through insect fertilizer application - Zhao et al.

The leaching and vertical migration risks of antibiotic resistance genes (ARGs) from fertilized soil to groundwater poses a significant threat to ecol...

www.sciencedirect.com

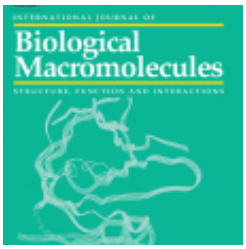
11/03/2025

Research note: In vitro anticoccidial activity of protein and lipid extracts from the black soldier fly larvae (Hermetia illucens) - Sedano et al.

Avian coccidiosis, caused by Eimeria spp., is the main parasitic disease in the poultry industry, responsible for high economic costs worldwide. Faced...

www.sciencedirect.com

hermetia illucens



08/03/2025

Structural and functional changes induced by different ultrasound-frequency-assisted xylose-glycation inhibits lysinoalanine formation in Tenebrio molitor protein - Zhang et al.

We explored the effects of sonication-assisted xylose (Xyl) grafting on the structure and functionality of Tenebrio molitor protein (MP). Different ul...

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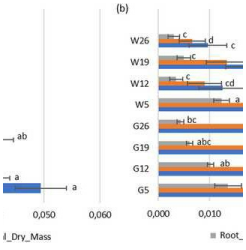
tenebrio molitor



05/03/2025

Establishment of barley (Hordeum vulgare L.) seedlings is affected by application of frass from Hermetia illucens - Lomonaco et al.

Climate change poses a threat to the establishment of winter cereals due to warmer temperatures and reduced precipitation in fall and winter. This can hinder germination by lowering soil water content or lead to faster initial growth that depletes residual water, causing subsequent water stress. Insect frass application has been proposed as a soil amendment with various effects on plant growth. This study tested the hypothesis ...

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04/03/2025

Physicochemical fermentation characteristics and changes in antioxidant activity of mealworms (Tenebrio molitor) during fermentation with lactic acid bacteria: Application and selection of commercial lactic acid bacteria starters - Kim et al.

This study investigated the characteristics of fermentation in mealworms inoculated with commercial lactic acid bacteria starters (ABY-3, FLORA DANICA...

www.sciencedirect.com

tenebrio molitor

03/03/2025

Cutting-Edge Insect Processing: Unlocking the Potential for Bacterial Reduction in Black Soldier Fly (Hermetia illucens) Protein - Sudwischer et al.

Effective thermal treatment can reduce the microbial load of insects, but its effectiveness strongly depends on protein processing.

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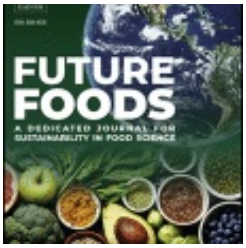
hermetia illucens



02/03/2025

From waste management to protein innovation: Black soldier fly as an embodiment of the circular bioeconomy - Bukchin-Peles et al.

The Black Soldier Fly (BSF), Hermetia illucens, represents a sustainable source of protein by converting organic waste into valuable products. BSF pro...

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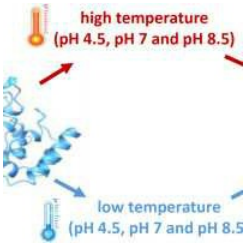
hermetia illucens



28/02/2025

Combined effect of temperature and pH on the structure and IgE-reactivity of Arginine Kinase from the edible insect Hermetia illucens - Delfino et al.

Insects are a good alternative source of proteins and other nutrients for human nutrition. In view of their possible use in the human diet in the west...

www.sciencedirect.com

25/02/2025

Optimization of a hatchery residue fermentation process for potential recovery by black soldier fly larvae - Dallaire-Lamontagne et al.

The conventional management of hatchery residues (HR) poses environmental issues and health risks for handlers. This study evaluates the potential of ...

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hermetia illucens

25/02/2025

Gastrointestinal stability of Dipeptidyl peptidase IV (DPP-IV)-inhibitory peptides identified in Tenebrio molitor - Berraquero-García et al.

Abstract The use of insects recently emerged as an alternative source of high-quality protein for the obtention of peptides with a wide range of bioactivities, such as antidiabetic, while offering a more environmentally sustainable approach. However, antidiabetic DPP-IV inhibitory peptides are often rich in leucine, making them susceptible to degradation by pepsin and chymotrypsin during gastrointestinal digestion. This study uses ...

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23/02/2025

Enhancing Plastic Decomposition in Mealworms (Tenebrio molitor): The Role of Nutritional Amino Acids and Water - Wang et al.

The decomposition of single-use plastics by selected insects is often sustained or enhanced through the addition of natural supplements or feeds. Herein, the rationale behind these choices is demonst...

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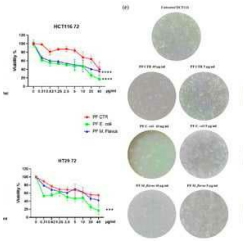
tenebrio molitor



22/02/2025

Peptide Fractions Extracted from the Hemolymph of Hermetia illucens Inhibit Growth and Motility and Enhance the Effects of Traditional Chemotherapeutics in Human Colorectal Cancer Cells - Lucchetti et al.

Cancer is a leading cause of death worldwide, characterized by uncontrolled cell growth and multiple mutations. Chemotherapy is often associated with harmful side effects, and cancer cells may become resistant through various mechanisms. New approaches, which are able to address both the toxicity and resistance issues of chemotherapy, are of primary importance in cancer research. Antimicrobial peptides (AMPs), naturally occurring ...

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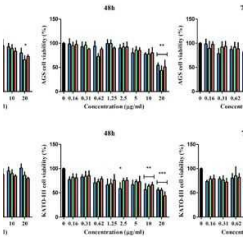
hermetia illucens



22/02/2025

Biological Activity of Peptide Fraction Derived from Hermetia illucens L. (Diptera: Stratiomyidae) Larvae Haemolymph on Gastric Cancer Cells - Rinaldi et al.

Gastric cancer (GC) is one of the leading causes of cancer-related mortality worldwide, characterised by poor prognosis and limited responsiveness to chemotherapy. There is a need for new and more effective anticancer agents. Antimicrobial peptides (AMPs) represent a promising class of biomolecules for this purpose. Naturally occurring in the innate immune system, these peptides can also exert cytotoxic effects against cancer cells, ...

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hermetia illucens

21/02/2025

Effects of nitrogen fertilizer replacement with different sourced-black soldier fly frass on rice growth, physiological characteristics and soil properties - Cao et al.

Application of black soldier fly larvae (BSFL) frass had significant effects on crop yield and soil quality. However, the effects of different sourced...

www.sciencedirect.com

hermetia illucens

21/02/2025

Volatile organic compounds as potential indicators of stress in black soldier fly (Diptera: Stratiomyidae) larvae - Cattaneo et al.

Abstract The industrial production of insects is experiencing significant growth as a sustainable source of proteins and other valuable nutrients for use as feed in the livestock industry. However, information regarding methods for assessing insect welfare in these systems is lacking. Given the diversity of insects produced, it is important to develop specific methods for each insect model for evaluating stress responses. Doing ...

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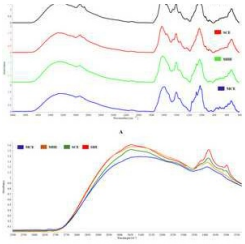
hermetia illucens



19/02/2025

Processing of silkworm (Bombyx mori) pupae waste and mealworm (Tenebrio molitor) larvae: Chemical characterization of extracts rich in anti-oxidant, anti-diabetic, and anti-obesity activity - Anusha et al.

Edible insects have gained recognition as sustainable protein sources with promising health benefits. The current study was aimed to quantify the major bio-active compounds present in aqueous extracts of spent silkworm (Bombyx mori) pupae and mealworm (Tenebrio molitor) larvae, and evaluate their bio-active potential. The total polyphenol content in extracts ranged from 150 to 330.26 mg GAE/100 g, while the flavonoid content varied ...

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tenebrio molitor

19/02/2025

Testing an insect-plant circular system based on black soldier fly and duckweed - Arce-Valdés et al.

Abstract Optimizing the circularity of insect farming by reusing and repurposing its byproducts is a priority to reach global sustainable goals that benefit both nature and people. The frass of the black soldier fly (BSF) has been used as fertilizer for various crops, but its potential in promoting the growth of aquatic plants with high-protein content has not been investigated. Here, we assess the potential of using BSF frass ...

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hermetia illucens

19/02/2025

Isolation and characterization of ice recrystallization inhibitory molecules from black soldier fly larvae - Fomich et al.

Abstract Black soldier fly larvae (BSFL) have demonstrated cold tolerance that suggests the presence of cryoprotective molecules. The objective of this research was to investigate if the proteins present in the BSFL have ice recrystallization inhibition (IRI) activity and how different environmental factors affect the activity. Osborne fractionation of the defatted BSFL was performed to separate the proteins based on solubility, ...

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hermetia illucens

17/02/2025

Evaluation of nutritional and techno-functional aspects of black soldier fly high-protein extracts in different developmental stages - Khan et al.

The global need for sustainable protein sources has contributed to the search for alternatives to conventional livestock and aquaculture feed. The bla...

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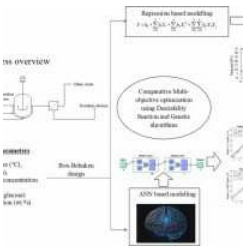
hermetia illucens



17/02/2025

Machine learning-based predictive modeling and optimization: Artificial neural network-genetic algorithm vs. response surface methodology for black soldier fly (Hermetia illucens) farm waste fermentation - Okoro et al.

Recognizing the complexity of non-linear and interdependent biological processes, this study compared the predictive performance of artificial neural ...

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12/02/2025

Interaction between Tetrabromobisphenol A and invertebrates in rigid polyurethane biodegradation: Inhibitory effects, chemical transformation and microbial adaptation - Zhu et al.

Tetrabromobisphenol A (TBBPA) is a brominated flame retardant widely used in electronic plastics, but its effects on invertebrate-mediated plastic bio...

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11/02/2025

Black soldier fly farming in Bangladesh: current practices, farmer's challenges and future opportunities - Akanda et al.

Abstract Black soldier fly (BSF) farming provides a sustainable solution for waste management and animal feed costs. This study explores the current practices, challenges, and opportunities of BSF farming in Bangladesh through a survey of 60 farmers across 21 districts, using Kobo-Toolbox through a combination of Computer-assisted Personal and Telephonic Interview (CAPI and CATI) method with purposive and snowball sampling. Mal...

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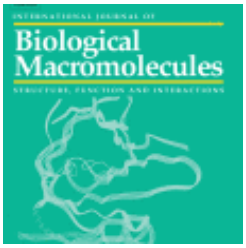
hermetia illucens



10/02/2025

Hermetia illucens-derived chitosan as a promising sustainable biomaterial for wound healing applications: development of sponge-like scaffolds - Giani et al.

Chitosan (CS), a biopolymer known for its wound-healing properties, has garnered significant interest in biomedical research. This study explores the ...

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hermetia illucens

10/02/2025

Dietary inclusion of Tenebrio molitor L. frass affects nutrient digestibility, ruminal fermentation activities, blood metabolites, and milk performance in goats - Hassanien et al.

This research aimed to evaluate the inclusion of mealworm frass (MF, from Tenebrio molitor L.) in the rations of dairy goats. The hypothesis was that ...

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tenebrio molitor

10/02/2025

Unpacking the benefits of black soldier fly frass fertilizer towards nematode suppression and potato production - Anedo et al.

1 Introduction Globally, 33 – 52% of soils are affected by moderate and severe degradation, majorly due to soil erosion, salinization, acidification, and agricultural intensification (FAO and ITPS, 2015; ELD, 2015; Kopittke et al., 2019). The ongoing soil degradation is projected to reduce food production by 12% and increase food prices by 30% (ELD, 2015). In Africa for instance, approximately 83% of the arable land is degraded, with 75% severely depleted and lacking essential nutrients necessary for optimal crop growth and yield (Chianu ...

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hermetia illucens

09/02/2025

The Development of Yellow Mealworm (Tenebrio molitor) as a Cheap and Simple Model to Evaluate Acute Toxicity, Locomotor Activity Changes, and Metabolite Profile Alterations Induced by Nanoplastics of Different Sizes - Sun et al.

This study developed yellow mealworm as an alternative model to investigate the acute toxicity of nanoplastics. We observed dose-dependent and time-dependent increase of death rate, as well as hypera...

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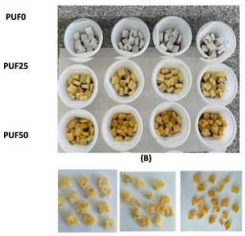
tenebrio molitor



08/02/2025

Polyurethane foam degradation combining ozonization and mealworm biodegradation and its exploitation - Ros et al.

The biodegradation of polyurethane foam (PU foam) using a combination of oxidative pre-treatment (ozonization) and Tenebrio molitor (T. molitor) mealworms was conducted in this study. Different degrees of ozone oxidation (0%, 25%, and 50%) were applied to PU foam, which was subsequently fed to mealworms. The mealworms' survival and growth were then compared to mealworms receiving a normal diet (bran). Results showed that mealworms ...

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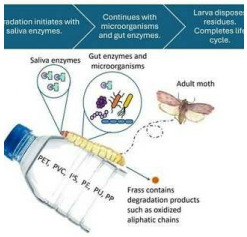
tenebrio molitor



05/02/2025

Using Insect Larvae and Their Microbiota for Plastic Degradation - Vital-Vilchis et al.

Plastic pollution is one of the biggest current global threats to the environment given that petroleum-based plastic is recalcitrant and can stay in the environment for decades, even centuries, depending on the specific plastic type. Since less than 10% of all plastic made is recycled, and the other solutions (such as incineration or landfill storage) are pollutant methods, new, environmentally friendly solutions are needed. In ...

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tenebrio molitor

03/02/2025

Electroconductive Bionanocomposites from Black Soldier Fly Proteins for Green Flexible Electronics - Testa et al.

Printed and flexible electronics hold the potential to revolutionize the world of electronic devices. A primary focus today is their circularity, which can be achieved by using biobased materials. In this study, electrically conductive bionanocomposite materials suitable for flexible electronics were fabricated using proteins from the black soldier fly (BSF, Hermetia illucens). The valorization of BSF biomacromolecules is currently being pursued in the framework of emerging circular economy models for the bioconversion of the Organic Fraction ...

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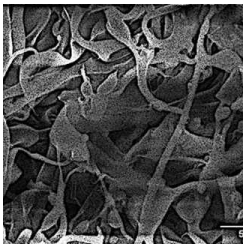
hermetia illucens



03/02/2025

Chitosan reduces the toxicity of frass from black soldier flies (Hermetia illucens) used to cultivate Pepper (Capsicum annuum L.) - El Amerany et al.

Although the many properties of frass from black soldier fly (Hermetia illucens), its application as a fertilizer is unsuccessful due to its toxicity. To solve this problem, its effects on seed germination and pepper (Capsicum annuum L.) development were studied in the presence and absence of chitosan (Ch). For the germination test, treatments consisted of deionized water (W), acetic acid (AA: 0.08%), two doses of Ch (Ch1: 0.75 ...

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hermetia illucens

31/01/2025

Extraction procedure and theoretical studies of chitin from black soldier fly - Akter et al.

The black soldier fly (BSF) is an efficient converter of residual biomasses into valuable product molecules and biomolecules. It has attained significant consideration for sustainable resource recovery and waste management. Chitin was extracted, isolated and purified from BSF (Yield 15%) and was characterized using Fourier transform infrared spectroscopy (FTIR) and X-ray diffraction (XRD). Two fractions were obtained by sieving ...

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hermetia illucens

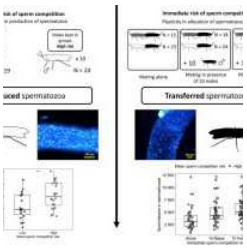
30/01/2025

Deep eutectic solvent extraction and biological activity of polysaccharides from Tenebrio molitor - Yang et al.

This study aimed to extract polysaccharides from Tenebrio molitor using ultrasound-assisted deep eutectic solvent (DESs) and to evaluate their structural features, as well as their antimicrobial, antioxidant, and α-amylase inhibitory activities. Various DESs were tested for polysaccharides extraction, and the process was optimized using response surface methodology (RSM). A preliminary structural analysis of the polysaccharides was conducted using infrared spectrum. The DESs were characterized by measuring their pH, viscosity, conductivity, ...

www.cell.com

tenebrio molitor



30/01/2025

Plastic responses in sperm expenditure to sperm competition risk in black soldier fly (Hermetia illucens, Diptera) males - Manas et al.

In polyandrous species, competition between males for offspring paternity goes on after copulation through the competition of their ejaculates for the...

www.sciencedirect.com

hermetia illucens

30/01/2025

Exploring the potential of crossbreeding to enhance black soldier fly (Hermetia illucens) production - Meyermans et al.

Abstract The increasing world population leads to a growing demand for animal protein, calling for sustainable solutions. Insects, such as the black soldier fly (Hermetia illucens, BSF), will therefore play a crucial role due to their fast growth, high protein content, good bioconversion efficiency and their ability to thrive on diverse feed substrates. Selective breeding has proven valuable in plants and livestock and holds great ...

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hermetia illucens

29/01/2025

Towards circularity for agro-waste: Minimal soil hazards of olive pomace bioconverted frass by insect larvae as an organic fertilizer - Mostafaie et al.

As global populations escalate and the demand for food and feed intensifies, the generation of agri-food waste is becoming an increasingly critical is...

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25/01/2025

Adsorption indigo carmine using chitosan from black soldier fly (Hermetia illucens L.): Insights into scalable application in real wastewater systems - Hevira et al.

This study investigates the effectiveness of chitosan derived from Black Soldier Fly (BSF) exuviae in removing indigo carmine (IC) dye from aqueous so...

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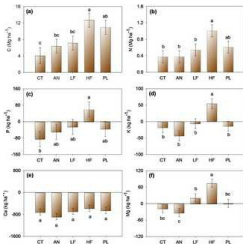
hermetia illucens



24/01/2025

Insect frass fertilizer as soil amendment for improved forage and soil health in circular systems - Ashworth et al.

Insect farming is expected to increase in coming years, thus generating high quantities of frass (insect excreta). Frass valorization hinges on basic agronomic research prior to industry upscaling. Here, we investigated soil physiochemical properties, SMAF (Soil Management Assessment Framework) soil health, CO2 efflux, and bermudagrass [Cynodon dactylon (L.) Pers.] yield and quality as affected by yellow mealworm (Tenebrio molitor ...

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20/01/2025

Development of a Sustainable Flexible Humidity Sensor Based on Tenebrio molitor Larvae Biomass-Derived Chitosan - Nettey-Oppong et al.

This study presents the fabrication of a sustainable flexible humidity sensor utilizing chitosan derived from mealworm biomass as the primary sensing material. The chitosan-based humidity sensor was fabricated by casting chitosan and polyvinyl alcohol (PVA) films with interdigitated copper electrodes, forming a laminate composite suitable for real-time, resistive-type humidity detection. Comprehensive characterization of the chitosan ...

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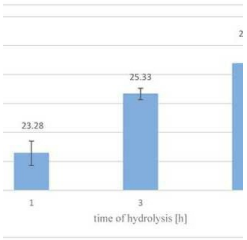
tenebrio molitor



20/01/2025

Sustainable Protein Sources: Functional Analysis of Tenebrio molitor Hydrolysates and Attitudes of Consumers in Poland and Spain Toward Insect-Based Foods - Maciejewska et al.

This study explores the potential of Tenebrio molitor protein hydrolysates as functional food ingredients, evaluating their bioactivity and consumer acceptance of the incorporation of edible insects into food across Poland and Spain. By aligning technical advancements with consumer preferences, this research bridges the gap between laboratory innovation and market feasibility, contributing to the development of sustainable functional ...

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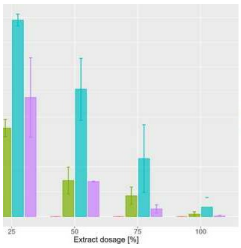
tenebrio molitor



20/01/2025

Potential of black soldier fly larvae frass (BSFL) as a novel fertilizer: impacts on tomato growth, nutrient uptake, and mycorrhizal formation - Salomon et al.

Background and Aims The growing rates of production of edible insects is leading to an increase in the availability of insect frass, comprising mostly the solid excretions of larvae and undigested substrate. Insect frass is considered a novel organic fertilizer, rich in nutrients and believed to further boost plant growth through its high content of substances like chitin. This study investigated the fertiliser potential of black ...

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hermetia illucens

16/01/2025

Chitin Analysis in Insect-Based Feed Ingredients and Mixed Feed: Development of a Cost-Effective and Practical Method - Sudwischer et al.

Insects are used as an alternative sustainable, protein-rich ingredient in fish, pet, pig and poultry diets. The significant difference between insect meals and common protein sources is the content ...

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16/01/2025

Antibacterial activity of fat from black soldier fly (Hermetia illucens) larvae against antibiotic resistant Campylobacter spp. strains - Silvan et al.

Abstract In this study, the antibacterial effect of fats derived from black soldier fly larvae (BSFL) were evaluated against various antibiotic-resistant strains of Campylobacter jejuni and Campylobacter coli. BSFL fats with different free fatty acids (FFAs) contents were obtained based on the larvae's processing conditions. Initially, antibiotic susceptibility testing revealed that all Campylobacter strains were resistant to at ...

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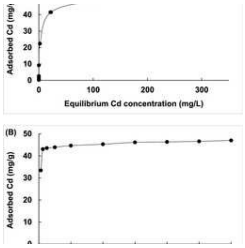

15/01/2025

Adsorption characteristics and mechanism of Cd by mealworm frass - Kim et al.

This experiment was conducted to evaluate the adsorption–desorption characteristics and mechanisms of heavy metals by the mealworm frass (MF). The adsorption characteristics of Cd by MF were predominantly influenced by initial pH, MF dosage, temperature, and reaction time. The maximum adsorption capacity of Cd by MF was 48.1 mg/g, which was well described by Langmuir isotherm and pseudo-second-order models. The optimal desorption ...

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tenebrio molitor

14/01/2025

Insect-based chitin and chitosan from whole body sources and rearing by-products: extraction, physicochemical, structural and bioactivity characterisation - Navarro et al.

Abstract Fractionation of edible insects and their rearing by-products can lead to expanded industrial applications and extraction of value-added products. The main goal of this study was to extract chitin and synthesise chitosan from three different insect sources – Tenebrio molitor larvae, adult Acheta domesticus and A. domesticus rearing by-products (legs and wings). Furthermore, the physicochemical, structural, and bioactive ...

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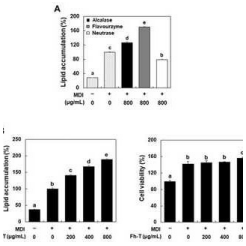

12/01/2025

Mealworm-Derived Protein Hydrolysates Enhance Adipogenic Differentiation via Mitotic Clonal Expansion in 3T3-L1 Cells - Ryu et al.

Adipocytes secrete adipokines, bioactive molecules crucial for various physiological processes, such as enhancing insulin sensitivity, promoting wound healing, supporting hair growth, and exhibiting anti-aging effects on the skin. With the growing global demand for sustainable and alternative protein sources, insect-derived proteins, particularly from Tenebrio molitor (mealworms), have gained attention due to their high nutritional ...

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tenebrio molitor

11/01/2025

Selective breeding of heat-tolerant black soldier fly (Hermetia illucens) larvae: gut microbial shifts and transcriptional patterns - Feng et al.

Abstract The black soldier fly larvae (BSFL) have garnered great attention for their potential role in converting organic waste into high-quality insect proteins, providing valuable feed components for animal production and highly enriched organic manure for crop production. However, environmental factors such as high temperatures can compromise their productivity. To address this, we conducted selective breeding of BSFL at 40 ...

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hermetia illucens

09/01/2025

Genetic improvement of farmed insect species: programmes, progress, and prospects - Gowda et al.

Abstract Like other animal farming systems that aim for maximum productivity and economic sustainability, the cultivation of insects for food and feed sectors requires the use of high-performance genetic lines that are adapted to specific rearing conditions. Therefore, investing in genetics and breeding programmes to domesticate and develop insect strains suitable for commercial production is imperative: if implemented appropriately, ...

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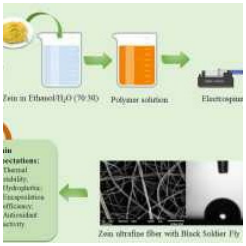

08/01/2025

Encapsulation of black soldier fly larvae oil in zein ultrafine fibers via electrospinning: Characterization and antioxidant properties - Trindade et al.

Black soldier fly larvae (BSFL) have several advantages, such as rapid growth and sustainable production. The electrospinning encapsulation shows prom...

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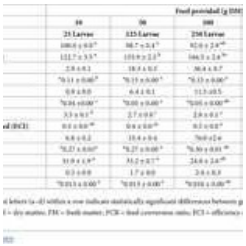

08/01/2025

The hidden drivers: Unraveling the impact of density, moisture, and scale on Hermetia illucens rearing - Nayak et al.

The black soldier fly (Hermetia illucens) is a saprophagous insect known for bioconverting organic waste, potentially offering environmental benefits, such as contributing to waste reduction and nutrient cycling. The performance of larvae varies significantly with factors substrate moisture, larval density, and scale of production. Three experiments were conducted using a mix of spent mushroom substrate (SMS) and chicken feed (CF). ...

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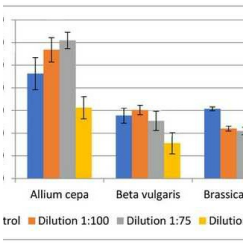
hermetia illucens



08/01/2025

Application of Mealworm Frass in Organic Seedling Production of Allium cepa L., Beta vulgaris L., and Brassica rapa L. - Baldacchino et al.

Horticulture is mainly based on transplanting seedlings produced by specialized nurseries. The recent European authorization of frass in organic farming presents new opportunities for the development of organic seedling production. Frass, a by-product of insect farming, offers innovative solutions for this sector. It mainly consists of insect excrement, exuviae, and uningested feed. Their fertilizing and biostimulating effects ...

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tenebrio molitor

04/01/2025

The structural modifications and techno-functional properties of yellow mealworm protein concentrate is influenced by the presence of residual lipids - Berthelot et al.

Abstract In this study, we compared the impact of partial and total defatting by using hexane and chloroform-methanol respectively, on the lipid and protein profiles, protein structure, and techno-functional properties of a yellow mealworm protein concentrate to address the influence of residuals lipids. The results showed significant changes in the particle size distribution (bimodal versus monomodal), surface hydrophobicity (49.35 ...

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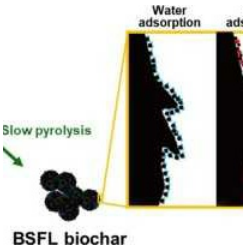
tenebrio molitor



03/01/2025

Insect-derived biochar for CO2 adsorption under humid conditions: Elucidating adsorption mechanisms and competitive interactions with water molecules - Kim et al.

The CO2 adsorption capacity of biochar depends on the type of biomass used and its physicochemical properties; various sorption parameters including t...

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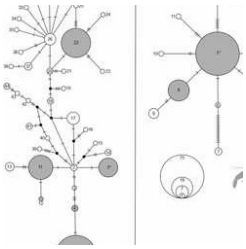

02/01/2025

Broad acceptance of sustainable insect-based shrimp feeds requires reproducible and comparable research - Barth et al.

The black soldier fly (BSF) has great potential as a sustainable aquaculture feed. However, for shrimp aquaculture, research on BSF-based feeds has only recently started and the few available studies show a heterogeneous picture in terms of growth parameters of shrimp. While some of these varying results may be explained by the properties of the insect feed used, it is likely that yet unknown parameters also play a role. Moreover, ...

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hermetia illucens

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- Insect Meal (Tenebrio molitor) Has High Nutrient Digestibility for Newly Weaned Piglets - Pereira et al. - 2025 - Animal Science Journal - Wiley Online Library
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