Newsletter N°14 on Insects for feed, food and bioconversion of organic substrates

Items published between 01 May and 30 June 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.

Substrate - media

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

03/06/2025

Bech-Bruun supports Insectum: Insect technology converting organic waste into protein and fertiliser - Bech-Bruun

Bech-Bruun supports Insectum: Insect technology converting organic waste into protein and fertiliser Bech-Bruun

consent.google.com

02/06/2025

“Inside the Safe Insects project: Revolutionising insect feed”

Reports show underused organic residual flows are a source of valuable nutrients. The food safety risks associated with residual flows such as manure and kitchen waste currently restrict their use as insect substrates. All About Feed spoke to the Project Leader, Elise Hoek-van den Hil of Wageningen Food Safety Research (WFSR), on the safety of [...]

www.allaboutfeed.net

14/05/2025

Insect protein startup gains investment | News | World Fishing

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13/05/2025

Williamsport company uses insects to prevent food waste - sungazette.com

Williamsport company uses insects to prevent food waste sungazette.com

consent.google.com

02/05/2025

Can InsectBiotech crack the code on insect ag economics by tapping into Spain’s olive waste? - AgFunderNews

Can InsectBiotech crack the code on insect ag economics by tapping into Spain’s olive waste? AgFunderNews

consent.google.com

Substrate - articles

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

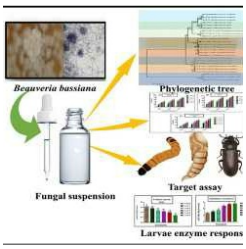
30/06/2025

Optimizing Black Soldier Fly (Hermetia illucens) production: effects of substrate variation on biomass, nutritional quality, hatchability, fecundity, and frass quality - Ogello et al.

IntroductionInsects such as the Black Soldier Fly (Hermetia illucens, BSF) are increasingly recognized for their potential to convert organic waste into high...

www.frontiersin.org

hermetia illucens



28/06/2025

Effects of Beauveria bassiana on Tenebrio molitor (Coleoptera: Tenebrionidae) and its impact on catalase and glutathione S-transferase enzymes - Vivekanandhan et al.

This study employed the insect bait method to isolate native entomopathogenic fungi (EPF) from soil samples. Additionally, the research examined fungi...

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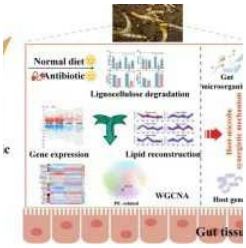
tenebrio molitor



28/06/2025

Integrated multi-omics reveals mechanistic impact of gut microbiota inhibition on lignocellulose biodegradation in Tenebrio molitor - Mao et al.

Tenebrio molitor demonstrates an excellence ability to biodegrade lignocellulosic waste rapidly, though the specific mechanisms behind this process re...

www.sciencedirect.com

tenebrio molitor

26/06/2025

From Plant By-Products to Insects to Shrimp: A Pathway to Sustainable Aquaculture Feed in a Circular Economy - Barth et al.

Shrimp aquaculture often has a large environmental footprint, partly due to the fish meal content of commercial shrimp feeds. One potential way to improve ecological sustainability would be to replac...

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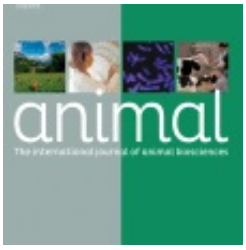

25/06/2025

Review: Enhancing resilience of Mediterranean food systems through insect-based biotransformation of agri-food side streams (black soldier fly and yellow mealworm) - Khieya et al.

Biotransformation of agricultural waste streams using insects presents a promising solution to the environmental and food security challenges encounte...

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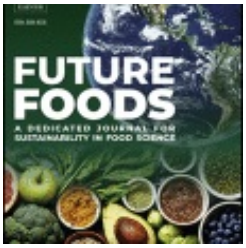


21/06/2025

Feeding black soldier fly (Hermetia illucens) larvae with mushrooms and then exposing them to UVB produces larvae extremely rich in vitamins D2 and D3 - Morand-Laffargue et al.

Black soldier fly larvae (BSFL) are a sustainable source of protein for feed but they can also be a sustainable source of some phytochemicals due to t...

www.sciencedirect.com

hermetia illucens

20/06/2025

Utilizing spent mushroom substrate for rearing black soldier fly (Hermetia illucens) larvae: enhancing fertilizer efficiency and improving animal feed quality for sustainable agriculture - Kanjanarat et al.

Spent mushroom substrate (SMS), a byproduct of mushroom cultivation, has high potential as a substrate for rearing animals, including black soldier fly larvae (BSFL). However, due to its low nutrient content, mixing it with other organic waste is necessary to enhance its efficiency and effectiveness. We evaluated three types of SMS—Agrocybe cylindracea, Lentinus polychrous, and Pleurotus pulmonarius—supplemented with mixed vegetables at three different levels (0% (VEG or control), 15%, and 30% (w/w)) and subjected to two pre-treatment ...

peerj.com

hermetia illucens

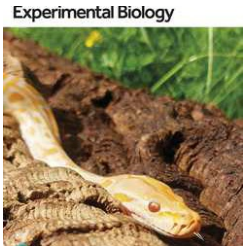
20/06/2025

Bacteriological quality of fresh and processed black soldier fly Hermetia illucens larvae reared on chicken manure in Kitwe, Zambia - Mapiki et al.

Isolation and identification of Escherichia coli and Staphylococcus spp. in processed black soldier fly larvae (BSFL) samples meant for animal feed indicate insufficient processing methods and pose a public health risk. For instance, some E. coli harbor ...

journals.asm.org

hermetia illucens



20/06/2025

Macronutrient balance dictates lifespan and reproduction in a beetle, Tenebrio molitor - Rho et al.

Summary: Macronutrient balance is a critical determinant of longevity and reproductive output in the mealworm beetle, Tenebrio molitor.

journals.biologists.com

tenebrio molitor

16/06/2025

Sofia diet: cooking up a standard diet for black soldier fly research - Zhelezarova et al.

Abstract With increasing interest in Hermetia illucens as a model organism for bioconversion, establishing standardized approaches for evaluating and comparing research outcomes is essential. Diets for black soldier fly (BSF) are often based on raw ingredients, which can vary significantly in quality, seasonality and availability, making research difficult to replicate and slowing industry development. To address this variability, ...

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hermetia illucens

11/06/2025

Micro- and nanoplastic size affects uptake and digestive tract region residence time in black soldier fly larvae during food waste bioconversion - Gold et al.

Black soldier fly (Hermetia illucens L.) larvae (BSFL) are promising recycling agents of food waste nutrients. However, BSFL ingest micro- and nanopla...

www.sciencedirect.com

hermetia illucens

11/06/2025

Effects of replacing protein with non-protein nitrogen sources on growth, development and composition of Tenebrio molitor larvae - Tamim et al.

Abstract It is suggested that Tenebrio molitor larvae (yellow mealworms) have the capacity to fix non-protein nitrogen (NPN) to produce amino acids. To test this, mealworms were fed an alpha-cellulose-based synthetic feed (Cell+) containing sources of energy (lipid and glucose), minerals and multivitamins, at concentrations predicted to be like wheat bran (WB), the same feed with casein added (13.8 g/100 g) (casein+), or WB. Following ...

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tenebrio molitor

11/06/2025

Performance and nutritional quality of black soldier fly (Hermetia illucens) larvae fed diets with varying crude protein and carbohydrate ratios - Dafri et al.

Abstract The increasing scarcity and environmental concerns associated with conventional protein sources, such as meat and bone meal (MBM) and soybean meal (SBM), underscore the urgent need for sustainable alternatives. Black soldier fly larvae (BSFL) offer a promising solution due to their high protein content and capacity to convert organic waste into valuable biomass. This study investigated the effects of three dietary prot…

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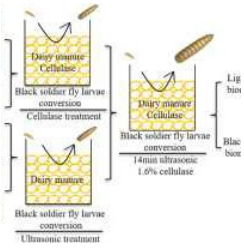
hermetia illucens



10/06/2025

Analysis of ultrasound and cellulase for biomass accumulation and lignocellulose biodegradation of dairy manure by black soldier fly(Hermetia illucens L.) - Li et al.

Resource utilization of dairy manure is an issue that needs to be addressed for it to be further utilized as biomass. We explored a new comprehensive …

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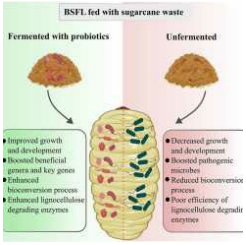

06/06/2025

Efficiency of microbial fermentation on microbial shifts, enzymatic activity, and transcriptions in black soldier fly larvae during the sugarcane waste conversion - Memon et al.

Sugarcane trash, consisting mainly of dried leaves, tops and cans, is often burned in the field, posing serious risks to human health, contributing to…

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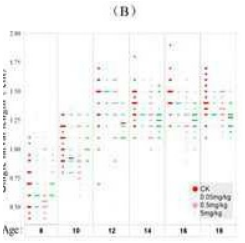
hermetia illucens



04/06/2025

Acrylamide Impacts on Black Soldier Fly Larvae: Growth, Toxicity, Microbes, and Bioaccumulation Risks for Food/Feed Safety - Hao et al.

This study investigated the effects of acrylamide on the growth, neurobehavioral responses, gut integrity, microbial composition, and toxicokinetics of black soldier fly larvae (BSFL). Larvae were exposed to acrylamide-contaminated diets at 0.05, 0.5, and 5 mg/kg (dry weight) to assess dose-dependent impacts. Results revealed that acrylamide exposure delayed larval growth peaks and reduced maximum weights by 6.17–76.01% (12–18 …

www.mdpi.com

hermetia illucens

28/05/2025

Enhancing agricultural waste bioconversion by Black Soldier Fly larvae through wheat bran supplementation - Raeiszadeh et al.

International Journal of Recycling of Organic Waste in Agriculture

oiccpress.com

hermetia illucens

28/05/2025

Production of mineral-enriched yellow mealworm (Tenebrio molitor) larvae through a seaweed-based dietary manipulation - Syahrulawal et al.

Abstract Yellow mealworm larvae (YML) are considered a sustainable nutrient source for food and feed applications due to their high nutrient contents while transforming low-grade bioresources. However, limited data exist on whether the mineral composition of YML could be improved via changes in their dietary compositions. This study examined the nutritional profile and composition of the larval gut microbiome of YML reared on the ...

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tenebrio molitor

27/05/2025

Productive performance of yellow mealworm larvae in different protein and carbohydrate level in the same energy substrate - Huang et al.

Yellow mealworm (Tenebrio molitor) larvae can efficiently convert waste into high-quality insect protein. However, the specific nutritional requiremen...

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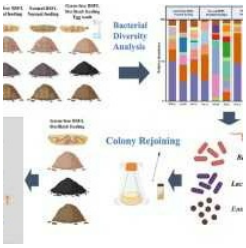
tenebrio molitor



24/05/2025

Host-mediated environmental microbiome recruitment by black soldier fly (Hermetia illucens) enhances waste biotransformation - Li et al.

The black soldier fly larvae (BSFL) have demonstrated the ability to convert organic waste into high-quality proteins, lipids, and chitin on an indust...

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hermetia illucens

22/05/2025

Physical properties of food waste influence the efficiency of black soldier fly larvae bioconversion via microbial activity - Fuhrmann et al.

Black soldier fly larvae bioconversion is an emerging industrial technology for more sustainable waste management and feed production. Recycling heter...

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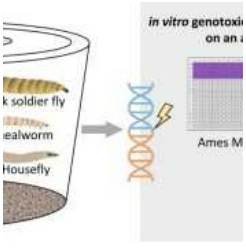
hermetia illucens



22/05/2025

Impact of aflatoxin B1-exposure on the genotoxic potential of larval extracts of the black soldier fly (Hermetia illucens), housefly (Musca domestica) and lesser mealworm (Alphitobius diaperinus) - Tao et al.

Aflatoxin B1 (AFB1)-contaminated crops could serve as insect feed without affecting growth and survival of black soldier fly (BSFL), housefly (HFL), a...

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hermetia illucens

21/05/2025

Valorization of black soldier fly larvae production using kitchen waste as alternative solution to waste management and source of protein for animal production in Dschang, Cameroon - Akwa et al.

The black soldier fly (BSF) is an eco-friendly insect known for its rapid reproduction, ease of rearing, and low breeding costs, making it a promising choice for practical use. It efficiently converts organic waste, like livestock manure and kitchen scraps, easing environmental strain, and offers a nutritious, cost-effective protein source for animal feed. This study investigated BSF larvae process performance on feed substrates, ...

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hermetia illucens

21/05/2025

Optimal dietary protein content and essential amino acid limitation in larvae of the black soldier fly (Hermetia illucens) - Berggreen et al.

Abstract A balanced diet is known to maximize animal performance, but a direct effect of dietary essential amino acid imbalance has rarely been demonstrated in insects. We show that deficiency in certain essential amino acids can be measured directly by growth in larvae of the black soldier fly (Hermetia illucens (L.)). Our results identified an optimal dietary protein content of 19.4% protein, corresponding to a P:C ratio of 1:2.8, ...

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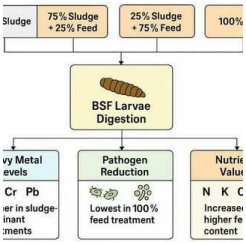
hermetia illucens



17/05/2025

Influence of Sludge and Feed Mixtures on Metal Retention, Pathogen Reduction, and Nutritional Value in Black Soldier Fly (BSF) (Hermetia illucens) Larval Substrates - Albalawneh et al.

Black soldier fly (BSF) larvae are increasingly used in sustainable waste management, offering potential for the bioconversion of organic waste into insect-derived fertilizer and animal feed. This study investigates the impact of varied substrate mixtures percentages of sludge and chicken feed on heavy metal accumulation, pathogen reduction, and nutrient composition in BSF frass. Methods: The experiment was conducted with four ...

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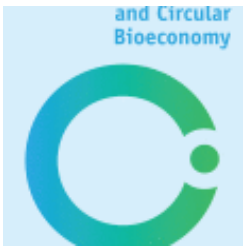
hermetia illucens



17/05/2025

Use of black soldier fly (Hermetia illucens) larvae in orange peel waste treatment - Tran et al.

In 2024, Vietnam was ranked 9th in global orange production, especially for the orange juice and essential oils industries, generating a huge amount o...

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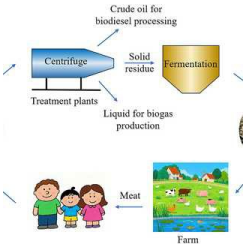
hermetia illucens



14/05/2025

Feeding black fly soldier larva using fermented solid residue generated from food waste three-phase separation - Chen et al.

During the pretreatment of some food waste (FW) treatment plants, FW is centrifugated to separate crude oil for biodiesel processing, liquid phase for anaerobic digestion (AD), and solid residue for AD or incineration. To increase the benefits of FW treatment, in this study, we tried black soldier fly larvae (BSFLs) cultivation using the solid residue before and after fermentation and evaluated the quality of larvae as animal protein ...

link.springer.com

hermetia illucens

14/05/2025

Tolerance and degradation of the insecticide pirimiphos-methyl and its metabolites by black soldier fly and yellow mealworm larvae - Donald et al.

Abstract Insect farming is gaining increasing attention because of the ability of insects to upscale a variety of waste and by-product biomass efficiently into proteins and lipids. In the European Union and in Norway, the use of insects is permitted in formulated pig, poultry, and fish feeds and more recently for human consumption. However, the European Food Safety Authority has highlighted the lack of data regarding the safety ...

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hermetia illucens

13/05/2025

Mycotoxins-contaminated wheat matrices bioconversion by Tenebrio molitor larvae (Coleoptera: Tenebrionidae) - Candian et al.

Larval development time, ADG, survival rate and substrate consumption were not negatively affected by the levels of mycotoxins contamination Larvae excreted most of the ingested DON and its derivati...

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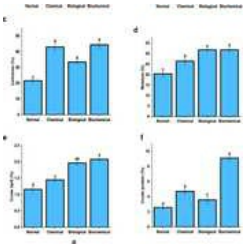
tenebrio molitor



12/05/2025

Valorising rice straw waste: pre-treatment and insect bioconversion as a bridge for waste management and sustainable feed production - Brahmacharimayum et al.

Rice straw is globally abundant agricultural by-product and faces significant waste management challenges. Insect bioconversion offers a promising valorisation strategy, transforming waste into valuable protein for animal feed applications. This study investigated the effects of four different rice straw pre-treatment methods—chemical (C), biological (B), biochemical (BC), and a control (N)—on substrate nutritional composition, ...

link.springer.com

12/05/2025

Conversion of wheat straw and food waste employing insect (Hermetia illucens) larvae into biomanure and protein-lipid-rich animal feed - Mishra et al.

Agricultural waste disposal has become a global problem, and its perilous discarding causes various issues of environmental pollution and resource ine...

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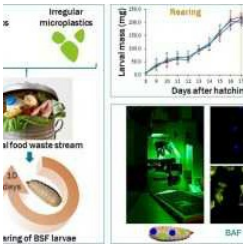
hermetia illucens



09/05/2025

Exposure of black soldier fly larvae to microplastics of various sizes and shapes: Ingestion and egestion dynamics and kinetics - Planche et al.

Black soldier fly (BSF, Hermetia illucens) larvae can valorize food waste into high-valuable products including animal feed. However, these wastes may...

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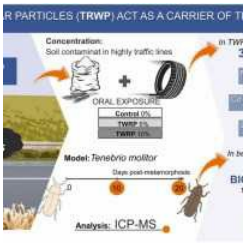
hermetia illucens



09/05/2025

Tyre and road wear particles as carriers of metals and rare earth elements: Evidence of bioaccumulation in Tenebrio molitor - Naccarato et al.

Tyre and road wear particles (TRWPs) are a significant source of micro- and nanoparticles contamination of aquatic environments. However, their occurr...

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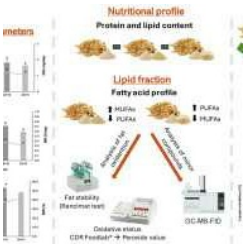

09/05/2025

Quinoa (Chenopodium quinoa) or quinoa husk in the diet of Tenebrio molitor: Productive parameters, larvae composition, saponins bioaccumulation and bioactivity - Cantero-Bahillo

This study evaluated the inclusion of quinoa (10 %, 30 %) and its by-product quinoa husk (10 %, 15 %) in the diet of Tenebrio molitor larvae, focusing...

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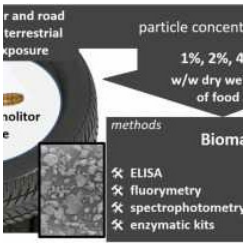
tenebrio molitor



08/05/2025

The effects of tread rubber and road dust particles on stress, immunity and digestive biomarkers in the larvae of the mealworm Tenebrio molitor - Babczyńska et al.

Airborne road and abrasive car parts particles penetrate into aquatic and soil environments, but also, settling on vegetation along highways, enter tr...

www.sciencedirect.com

tenebrio molitor

06/05/2025

Effects of rearing substrate and larval stage on the contamination levels of chemicals in black soldier fly larvae - Spranghers et al.

Abstract Possible risks associated with low value substrates used for sustainable and cost-effective rearing of the black soldier fly (BSF), Hermetia illucens, could be either biological or chemical. The aim of this study was to evaluate these risks specifically focusing on the bioaccumulation of commonly encountered chemicals. Firstly, bioaccumulation factors for BSF fifth instars and prepupae reared on biogas digestate were tested ...

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hermetia illucens

06/05/2025

Supplementing Hermetia illucens diet with minerals: effects on production performance, proximate composition and nitrogen loss - Rodde et al.

Abstract Black soldier fly (BSF, Hermetia illucens) farming is an emerging industry and the nutritional requirements of the larvae still remain unclear. In particular, the larval needs in micronutrients, such as minerals, are poorly understood although they play a critical role in insect physiology. Thus, we investigated whether supplementing BSF diet with polyhalite (K2MgCa2(SO4)4 · 2H2O), a pure mineral source, could improve ...

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hermetia illucens

06/05/2025

Temperature-dependent survival and aggregation behaviour of Hermetia illucens larvae in response to Beauveria bassiana infection - Kortsmit et al.

Abstract Larvae of the black soldier fly (BSF; Hermetia illucens) can feed on a wide range of organic residual streams, including those of agricultural origin. This may result in exposure to entomopathogenic fungi such as Beauveria bassiana that are increasingly used in biological control. The natural behaviour of BSF larvae to aggregate may be a defence mechanism to increase body temperature to combat infection. To study the effect ...

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hermetia illucens

05/05/2025

Evaluation of various diets for improved growth, reproductive and nutritional value of the yellow mealworm, Tenebrio molitor L. - Mahmoud et al.

Breeders are under growing pressure to enhance the production of farmed insects and shorten their life cycles due to the rising demand for edible insects. Feed for yellow mealworm was developed using five feed sources viz., faba bean flour, chickpea flour, wheat bran, wheat germ and Yeast, alone and in combination and resulting in 19 diet treatments. An investigation was carried out to determine the effects of diet combinations on the development, weight, and growth of Tenebrio molitor larvae, pupae, and adults. Results indicate that the ...

www.nature.com

tenebrio molitor

01/05/2025

Valorizing poultry by-products in mealworm production: nutritional and microbiological insights on Tenebrio molitor meal - de Oliveira et al.

Abstract This study evaluated poultry litter as a sustainable and cost-effective feed substrate for Tenebrio molitor larvae, focusing on its impact on larval development, nutritional composition, and the microbiological safety of the resulting mealworm meal. Diets with varying poultry litter inclusion levels, were tested to assess survival rate, weight gain, development time, and reproductive efficiency. Results demonstrated that ...

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tenebrio molitor

Product - media

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

24/06/2025

Consumer “disgust” and investment barriers deter widespread insect protein adoption, finds study

Cultural and psychological aversion to insects as a meat substitute could hinder their potential to reduce meat consumption, warn researchers. Despite insects’ sustainability benefits over the meat sector’s environmental footprint, efforts to promote edible insects in Western diets are challenged by limited investment and greater consumer acceptance of plant-based alternatives.

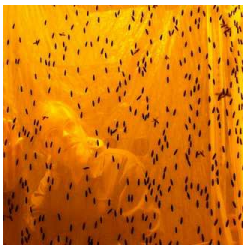
www.foodingredientsfirst.com

28/05/2025

Goterra marks milestone with first large-scale insect protein rendering trial

Australia-based Goterra has successfully completed its first large-scale insect protein rendering trial, which produced insect meal containing >70% protein and ~12% fat, exceeding industry requirements. The milestone follows the announcement of the company’s partnership with Skretting Australia in 2024 to integrate insect protein meal into aquaculture feed. Goterra has announced the successful completion of its [...] Goterra marks ...

www.feedandadditive.com



28/05/2025

Volare secures €26m funding to transform insect protein production in Europe | FoodBev Media

Finnish biotech company Volare has announced the successful closing of a €26 million funding round aimed at establishing what it claims will be the world's most energy-efficient protein production facility.

www.foodbev.com

hermetia illucens

20/05/2025

Why insect protein is the future of sustainable food

Why insect protein is the future of sustainable food—blending nutrition, low emissions, and food tech into tomorrow’s meals.

www.bing.com

05/05/2025

Aquafeed.com | Insect meal as aquafeed in Africa: It’s a matter of scale

Insect production has great potential to transform aquaculture and waste management in Africa, but it needs to be scaled up to an industrial level to achieve significant impact.

www.aquafeed.com

tenebrio molitor hermetia illucens

Product - articles

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

29/06/2025

Innovative Protein Ingredients for Feeding Gilthead Seabream (Sparus aurata) Broodstock - Aidos et al.

A feeding trial with alternative protein sources was conducted in gilthead seabream (Sparus aurata, L.) broodstock fed a control diet and two diets with 5% or 10% inclusion levels of a blend of novel...

onlinelibrary.wiley.com

28/06/2025

Assessing dried black soldier fly larva as a feed component for poultry production - Dillard et al.

The objectives of this research were to determine the nitrogen corrected true metabolizable energy (TMEn), and digestible amino acid content of dried ...

www.sciencedirect.com

hermetia illucens

27/06/2025

Enhanced Nile tilapia meat quality by the metabolomic effects of Tenebrio molitor larval meal dietary supplement - Liu et al.

The rising cost of soybean meal has posed challenges for tilapia (Oreochromis niloticus) farming. This study aimed to explore the use of Tenebrio moli...

www.sciencedirect.com

tenebrio molitor

27/06/2025

Full-fat or defatted black soldier fly (Hermetia illucens) larvae meal as a fish meal replacer in diet for Penaeus vannamei - Ko et al.

Abstract Fish meal (FM) replacement with full-fat or defatted black soldier fly (Hermetia illucens) larvae meal (FBSF and DBSF, respectively) in diet for Pacific white shrimp (Penaeus vannamei) was assessed. A control diet (Con) was formulated to contain 20% FM and 25%, 50% and 75% FM were replaced with FBSF or DBSF to prepare six other diets (designated as FBSF5, FBSF10, FBSF15, DBSF5, DBSF10 and DBSF15, respectively). Total of ...

brill.com

hermetia illucens

26/06/2025

Combining Hermetia illucens and Tenebrio molitor meals in diets for European seabass: Effects on growth, nutrient utilisation, intestinal morphology and muscle quality - Costa et al.

This study explored the potential of an insect meal (IM) mixture of black soldier fly larvae (BSFL) and yellow mealworms (YMs) to substitute 3% (diet ...

www.sciencedirect.com

tenebrio molitor hermetia illucens

25/06/2025

Comparative impact of partial replacement of soybean meal with select specialty protein ingredients in broiler chicken starter feeding program on growth, organ, intestinal, plasma, and litter attributes to 49 days of age - Tsementzis et al.

Speciality protein ingredients (SPI) are often added to partially replace regular soybean meal (SBM) in starter phase to bolster growth. However, ther...

www.sciencedirect.com

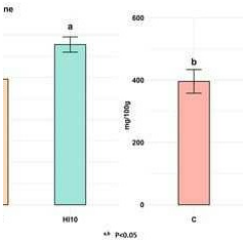
hermetia illucens

25/06/2025

Characterization of bacterial microbiota of insect-based products (novel foods) by 16S rRNA metabarcoding - Spatola et al.

Insect-based products (IBPs) are novel foods recently introduced in the market of the European Union (EU). Although IBPs could present new challenges ...

www.sciencedirect.com



24/06/2025

Bioactive Compounds in Breast Meat of Broiler Chickens Fed with Black Soldier Fly Wholemeal - Grassi et al.

This study investigated the effects of dietary supplementation with Black Soldier Fly (BSF) wholemeal on the content of bioactive compounds in broiler chicken breast meat. The experiment involved 45 male Ross 308 broiler chickens randomly assigned to three dietary groups: control diet, control diet supplemented with 5% (HI5), or 10% (HI10) black soldier fly (BSF) wholemeal. The diets were administered for 35 days. The study found ...

www.mdpi.com

hermetia illucens

24/06/2025

Study on black soldier fly larvae (Hermetia illucens) diet impact on snubnose pompano's (Trachinotus blochii) growth and skin mucus immunity - Rasanjalee et al.

Abstract Utilizing black soldier fly larvae (BSFL, Hermetia illucens) as an alternative protein source to replace fishmeal (FM) in aquaculture feeds is gaining popularity. This research assessed the effects of various BSFL inclusion levels (0, 25, 50 and 100%) in commercial fish feeds on the growth performance and skin mucus immunity of snubnose pompano (Trachinotus blochii). In the study, 30 snubnose pompano (2.669 ± 0.219 cm ...

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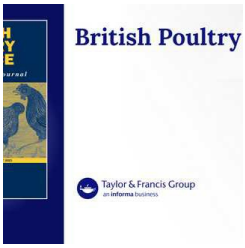
hermetia illucens



23/06/2025

Effect of partial replacement of soybean meal with gamma-irradiated black soldier fly larvae or crushed grasshopper on growth performance, carcass traits, meat quality and organoleptic characteristics in broiler chickens - Mohassesi et al.

1. The objective of the study was to investigate the effects of feeding varying levels of gamma-irradiated black soldier fly larvae (BSFL) and crushed grasshopper (GH) on performance, meat quality ...

www.tandfonline.com

hermetia illucens

23/06/2025

Technological evaluation of defatted black soldier fly (Hermetia illucens) larvae meal as a food ingredient in adult maintenance dog biscuits - Ragozzino-Paulino et al.

Abstract The incorporation of insect-based protein is emerging as a sustainable alternative in food production systems, particularly in the pet food industry. This study evaluated the partial replacement of wheat flour with Hermetia illucens larvae meal (HILM) at levels of 10%, 15%, and 20% in dog biscuit formulations. The effects on dough rheology, technological quality, and nutritional composition were assessed. HILM inclusion ...

brill.com

22/06/2025

Exploring the suitability of Tenebrio molitor powder (whole and defatted by supercritical CO2) as a partial fat replacement in bologna-type sausages - Rodríguez-Párraga et al.

Currently, insects are being introduced in Europe as an alternative, healthy, and sustainable food ingredient. The aim of this study is to evaluate th...

www.sciencedirect.com

tenebrio molitor

20/06/2025

Replacing fishmeal with an insect meal blend: Implications for intestinal microbiota in European seabass - Kalemi

In this study, we investigated the effects of an insect meal (IM) blend containing larvae of Hermetia illucens and Tenebrio molitor on the gut microbi...

www.sciencedirect.com

tenebrio molitor hermetia illucens

20/06/2025

Replacing fishmeal with an insect meal blend: Implications for intestinal microbiota in European seabass - Kalemi et al.

In this study, we investigated the effects of an insect meal (IM) blend containing larvae of Hermetia illucens and Tenebrio molitor on the gut microbi...

www.sciencedirect.com

18/06/2025

Impact of live black soldier fly larvae supplementation on laying hen performance, stress levels and excreta microbiota - Dabbou et al.

As the global demand for poultry products, particularly eggs, continues to rise, identifying environmentally sustainable alternative protein sources i...

www.sciencedirect.com

hermetia illucens

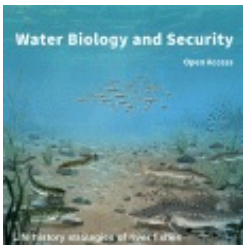
18/06/2025

Effects of different drying methods on the quality of dried black soldier fly larvae: Nutrient composition, physicochemical properties and microstructure - Wang et al.

Black soldier fly larvae are rich in protein and fat, which are suitable for both human food and animal feed. This study investigated the effects of f...

www.sciencedirect.com

hermetia illucens



18/06/2025

Effects of substitution of dietary fishmeal with protein blend and stocking density on growth performance, stress response, and protein utilization of gibel carp (Carassius gibelio, CAS V) - Yu et al.

Stocking density and feed protein sources are critical in aquaculture. This study investigated their effects on growth, stress response, and protein u...

www.sciencedirect.com

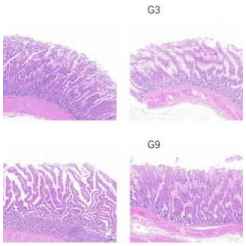
18/06/2025

Growth, feed utilization and digestibility of Oreochromis shiranus (Boulenger 1905) fed dietary yellow mealworm larvae (Tenebrio molitor) meal raised in earthen ponds - Gwaza et al.

This study investigated the effects of incorporating yellow mealworm larvae (Tenebrio molitor) on the growth, feed utilization, and digestibility of Oreochromis shiranus, a dominant aquaculture spe...

www.tandfonline.com

tenebrio molitor

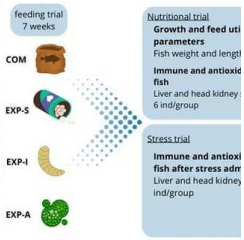


13/06/2025

Dietary inclusion of defatted black soldier fly larvae meal: impacts on laying hen performance, egg quality, serum biomarkers, and intestinal morphology - Chen et al.

This study investigated the effects of 3% (G3), 6% (G6), and 9% (G9) dietary defatted black soldier fly larvae (BSFL) meal on 288 Hy-Line Brown laying hens o...

www.frontiersin.org



13/06/2025

Effects of Feed Additives (Nannochloropsis gaditana and Hermetia illucens) on Growth and Expression of Antioxidant and Cytokine Genes in Nile Tilapia (Oreochromis niloticus) Subjected to Air Exposure Stress - Ardó et al.

A 7-week feeding trial was conducted with Nile tilapia juveniles with an average body weight of 143.5 ± 3.1 g in a cage system in order to test the effect of different feed additives on growth performance, antioxidant defense system, and immune status of fish. For this reason, experimental diets were formulated with inclusion of two different additives containing bioactive compounds, namely Nannochlorophsis gaditana in 3.5% (diet ...

www.mdpi.com

hermetia illucens

13/06/2025

Effects of heat treatments on the aromatic profile of edible insect species - Perez-Santaescolastica et al.

Edible insects are emerging as a viable solution for future food chains. Sterilisation and blanching are thermal treatments commonly used during their...

www.sciencedirect.com

13/06/2025

Microbial and biochemical characterisation of fermented house crickets (Acheta domesticus) and mealworm larvae (Tenebrio molitor) - Jamnik et al.

Abstract Edible insects have a large potential to be an alternative source of proteins for human consumption. Lactic acid fermentation can further increase availability of proteins as well as increase functional value of substrates. Thus, the study aimed to microbiologically and biochemically characterise house crickets (Acheta domesticus) and mealworm larvae (Tenebrio molitor) before and after lactic acid fermentation. Both insects ...

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11/06/2025

Fatty Acid Composition of African Catfish (Clarias gariepinus) Fed on Black Soldier Fly Larvae (Hermitia illucens) Formulated Diets - Maranga et al.

A four-months feeding experiment was conducted to evaluate the effects of fishmeal (FM) replacement using black soldier fly larvae (BSFL) on the fatty acid composition of catfish. Diets containing 35...

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hermetia illucens

09/06/2025

Black soldier fly, Hermetia illucens, larvae meal improves intestinal health and growth performance of Nile tilapia, Oreochromis niloticus, juveniles - Maulu et al.

This study investigated the effects of dietary black soldier fly (BSF) larvae, Hermetia illucens, meal on growth performance, feed utilization, intestinal health, and immune response in Nile tilapia,...

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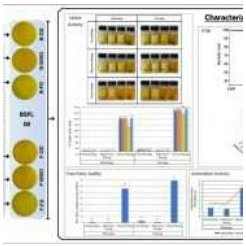
hermetia illucens



07/06/2025

Impact of killing and drying methods on physicochemical and functional properties of black soldier fly larvae (BSFL) oil - Haskaraca et al.

Black soldier fly larvae (BSFL) are a promising fat-rich alternative as a functional food ingredient. This study aimed to evaluate how different killi...

www.sciencedirect.com

hermetia illucens

06/06/2025

Hermetia illucens oil vs. hydrogenated palm fat in dairy cow nutrition: effects on digestive parameters, oxidative stress, and milk production performance - Rastello et al.

Background Scant information is currently available on the use of insect oils in ruminant diets. Insect oils could be used as alternatives to certain conventional plant lipid sources that are considered no longer sustainable. This trial aims at evaluating the effects of the dietary inclusion of Hermetia illucens oil (HIO) vs. hydrogenated palm fat (HPF) on digestive parameters, oxidative stress, and milk production performance ...

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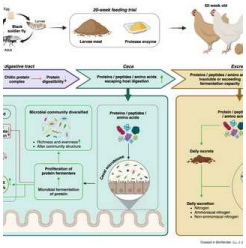
hermetia illucens



01/06/2025

Novel insight into the impact of black soldier fly larvae meal and protease on cecal microbiome, SCFAs, and excreta composition in laying hens - Lu et al.

Background Insect farming represents a sustainable loop that recycles organic wastes back to the food chain while requiring minimal inputs such as land and water. Insect products are not only low in environment footprint, but also nutrient-dense and contain health-promoting bioactives. Black soldier fly larvae meal (BSFLM) stands out as an excellent source of protein and chitin, and the latter is a polysaccharide associated with ...

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hermetia illucens

31/05/2025

Evaluation of the effect of black soldier fly (Hermetia illucens L.) larvae meal in the diet of red drum (Sciaenops ocellatus) juveniles on production performance and feed palatability - Paredes et al.

Black soldier fly (Hermetia illucens) larvae are insects capable of valorizing various waste streams into protein that has the potential to replace fish meal...

www.frontiersin.org

hermetia illucens

29/05/2025

Innovative protein sources for sustainable sheep farming: Assesing black soldier fly larvae meal in merino lamb diet - Odeon et al.

The growing global demand for animal-based food poses challenges to sustainability and animal welfare, especially in intensive production systems. Thi...

www.sciencedirect.com

hermetia illucens

28/05/2025

Effects of feeding unprocessed whole black soldier fly (Hermetia illucens) larvae on performance, biochemical profile, health status, egg quality, microbiome and metabolome patterns of quails - Liu et al.

To address the global shortage of feed protein, black soldier fly larvae (BSFL) have garnered significant attention as a sustainable alternative prote...

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hermetia illucens

27/05/2025

Nutritional composition of farmed insects: impact of species, developmental stage, and sex - Vehar et al.

Abstract In this study, seven insect species, Schistocerca gregaria (desert locust), Locusta migratoria (migratory locust), Tenebrio molitor (yellow mealworm), Acheta domesticus (house cricket), Gryllus assimilis (Jamaican field cricket), Alphitobius diaperinus (lesser mealworm) and Blaberus discoidalis (discoid cockroach), differing in sex and developmental stage, were analysed for fatty acid, amino acid, elemental and polyphenolic ...

brill.com

tenebrio molitor

27/05/2025

Insects to pigs and back: an attributional life cycle assessment - Méité et al.

Abstract Intensive livestock farming in the European Union requires extensive feed imports, such as soybean meal (SBM), which is associated with negative environmental impacts. Black soldier fly larvae (BSFL) have been identified as an option to substitute SBM in pig diets and as bioconverters of pig manure, contributing to closing the loop between manure production and the provision of protein-rich pig feed (pig–insect–pig nutrient ...

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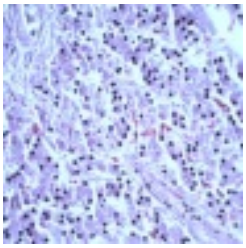

24/05/2025

Insect fat influences broiler performance, meat quality, and the cecal microbiota similarly to plant oils rather than animal fats - Aslam et al.

We evaluated the addition of Hermetia illucens larvae (BSFL) fat to broiler diets compared to that of soybean oil (SO), rapeseed oil (RO), palm oil (PO), palm kernel fatty acid distillate (PKFD), poultry fat (PF), pig lard (PL), and beef tallow (BT) on performance, meat quality, and cecal microbiota abundance. BSFL addition reduced the feed conversion ratio compared to PO, PF, and BT addition and improved nutrient digestibility ...

www.nature.com

hermetia illucens

24/05/2025

Egg Quality and Laying Performance of Rhode Island Red Hens Fed with Black Soldier Fly Larvae and Microalgae Meal as an Alternative Diet - Tovar-Ramírez et al.

The potential of black soldier fly larvae (BSFL) and microalgae (MA) in poultry diets has garnered increasing interest due to their high nutritional value and reduced environmental footprint. BSFL represent a sustainable alternative to conventional protein sources such as soybean meal, whereas MA contributes to improved egg quality, particularly through its enrichment with polyunsaturated fatty acids. This study assessed the effects ...

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hermetia illucens

23/05/2025

Influence of dietary black soldier fly (Hermetia illucens) meal on the quality attributes of aquaculture fish products: a meta-analysis - Tran et al.

Abstract This study employed systematic review and meta-analysis to evaluate the effects of black soldier fly meal (BSFM) on the fillet quality of key farmed fish species. In rainbow trout (Oncorhynchus mykiss), BSFM inclusion significantly improved fillet lightness, as well as saturated fatty acid (SFA) and n-6 polyunsaturated fatty acid (PUFA) contents (SMD = 0.45, 0.93, and 0.61, respectively; all P < 0.0001). However, total ...

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hermetia illucens

22/05/2025

Proteomic insights into novel food insects: Homology-based proteome characterization and allergenicity considerations for EU-regulated insect species - Meisinger et al.

Insects have emerged as a sustainable alternative protein source and recently gained regulatory approval in the European Union as novel foods and anim...

www.sciencedirect.com

20/05/2025

Evaluation of amino acid digestibility of black soldier fly larvae reared on different substrates in caecectomised laying hens - Kaewtapee et al.

The chemical composition and amino acid (AA) digestibility were determined in black soldier fly larvae (BSFL) reared on the substrates chicken feed (BSFLChicken feed), tofu residue (BSFLTofu residu...

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hermetia illucens

19/05/2025

Black soldier fly (Hermetia illucens Linnaeus) larvae meal - a promising protein source in bullfrog (Aquarana catesbeiana) feed - Zhou et al.

Our study assessed the impacts of black soldier fly larvae meal (BSFLM) substituting fishmeal at various levels in isolipidic and isonitrogenous diets...

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hermetia illucens

14/05/2025

Preliminary assessment of the nutritive value of dietary exuviae from black soldier fly (Hermetia illucens) pupae in Mozambique tilapia - Romano et al.

A by-product of black soldier fly (Hermetia illucens) larvae (BSFL) farming is the chitin-rich “exuviae” (exoskeleton shell) that is left behind after the prepupae larvae metamorphose into adults. Mo...

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hermetia illucens

14/05/2025

Dried black soldier fly larvae (Hermetia illucens) as environmental enrichment for laying hens – a full-scale commercial study - Tahamtani et al.

Abstract There is a growing interest in the use of insect larvae to promote sustainability and welfare of farmed animals such as swine and poultry. Previous studies have piloted the provision of insect larvae in small experimental groups of broiler chickens and laying hens, but this has not yet been tested in full commercial scale. This study reports the first full-scale provision of dried black soldier fly (H. illucens) larvae ...

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hermetia illucens

07/05/2025

Low drying temperature has negligible impact but defatting increases in vitro rumen digestibility of insect meals, with minor changes on fatty acid biohydrogenation - Renna et al.

Background Insect meals have been identified as innovative and sustainable feedstuffs that could be used in ruminant nutrition. However, current research on the effects that their processing may have on rumen digestibility and fatty acid (FA) biohydrogenation is scant. This trial aims to investigate the effects (i) of drying temperature of full-fat Hermetia illucens (HI) and Tenebrio molitor (TM) meals, and (ii) of residual ether ...

link.springer.com

06/05/2025

Impact of dietary supplementation of black soldier fly larvae (Hermetia illucens L.) on nutrient digestibility, serum antioxidants, ruminal volatile fatty acids, and abundance of microbial dominant flora in goats - Lu et al.

This experiment aimed to investigate the potential impact of supplementing different levels of black soldier fly (BSF) on growth performance, serum an...

www.sciencedirect.com

hermetia illucens

06/05/2025

Black Soldier Fly Larvae Meals With and Without Stickwater Highly Utilized in Freshwater by Atlantic salmon (Salmo salar) Parr - Bogevik et al.

Black soldier fly larvae (BSFL) meal is a promising sustainable protein source for aquafeeds. Processing BSFL into meal and oil can be based on wet rendering technology where the raw material is heat...

onlinelibrary.wiley.com

hermetia illucens

06/05/2025

Effects of black soldier fly larvae with and without algal oil on sensory and physical-chemical properties of Chinook salmon fillets - Bejaei et al.

Abstract The rising global demand for seafood products has increased the need for aquafeed ingredients from both traditional and novel sources, as fishmeal and fish oil production cannot significantly expand to support the industry growth. In light of this challenge, our study investigated the feasibility of the partial replacement of fishmeal and fish oil by black soldier fly larvae meal (Hermetia illucens, BSFLM), with and without ...

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06/05/2025

Effects of dietary black soldier fly larvae meal inclusion on the growth performance and intestinal health of Silkie crossbreed chicken - Li et al.

Abstract Black soldier fly larvae (BSFL) meal can be a sustainable alternative to soybean meal, however, its effects on slow-growing Silkie broilers have not been evaluated yet. Our objective was to assess the impact of dietary BSFL meal inclusion on feed conversion ratio (FCR) and intestinal health in Silkie chickens. During a three-week-long feeding trial, 72 female Silkie crossbreed chickens aged 39 days were randomly assigned ...

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Industrial applications - media

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

23/06/2025

Insect-Based Livestock Feed

India is promoting insect-based livestock feed as a sustainable and climate-friendly alternative to conventional animal feed, aiming to combat antimicrobial...

www.drishtiias.com

23/06/2025

Fighting antimicrobial resistance with insect-based livestock feed - thehindu.com

Fighting antimicrobial resistance with insect-based livestock feed thehindu.com

consent.google.com

19/06/2025

Nasekomo’s CEO joins IPIFF Board to advance insect protein sector

Marc Bolard, the Chief Executive Officer and Co-founder of Nasekomo, was appointed to the Board of the International Platform of Insects for Food and Feed (IPIFF). As a new member, Bolard will contribute to the platform’s mission to support the development of the insect sector in Europe and to represent the interests of insect protein [...] Nasekomo’s CEO joins IPIFF Board to advance insect protein sector yazısı ilk önce Feed & ...

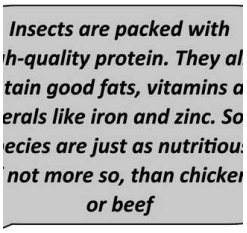
www.feedandadditive.com

08/06/2025

Insect protein study sparks backlash over methodology, environmental claims

A UK trade association challenged a recent life cycle assessment that highlighted conditional environmental benefits of insect protein compared to soybean...

www.petfoodindustry.com



17/05/2025

Power of insect protein!

When we think about the future of food, it’s unlikely that crickets, meal worms or grasshoppers come to mind. But believe it or not, insects might just be one of the most promising answers to two big global problems: feeding a growing (and ageing) population and fighting climate change. As the world’s population heads towards [...] The post Power of insect protein! appeared first on The Shillong Times.

theshillongtimes.com

06/05/2025

New Study: Insect protein enhances skin barrier and antioxidant defences for dogs

A study by the Federal University of Paraiba found that Protix’s black soldier fly protein, ProteinX, can improve dogs’ skin barrier and strengthen their antioxidant defences. According to the announcement, the results open up various opportunities for manufacturers to develop healthy pet products. The results of a study by the Federal University of Paraiba in [...] New Study: Insect protein enhances skin barrier and antioxidant ...

www.feedandadditive.com

hermetia illucens

Industrial applications - articles

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

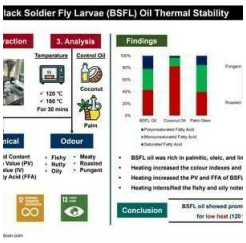
30/06/2025

Effect of Temperature on the Survival Rate, Development Time, and Sex Ratio of Hermetia illucens - Muñoz-Delgado et al.

Efecto de la temperatura en la tasa de sobrevivencia, tiempo de desarrollo y proporción sexual de Hermetia illucens La mosca soldado negra, Hermetia illucens (Linnaeus) (Diptera: Stratiomyidae), tiene una amplia capacidad para degradar residuos tanto orgánicos como inorgánicos, lo que la convierte en una herramienta potencial en la bioconversión de residuos. Este potencial se ve afectado por las condiciones ambientales en las que ...

bioone.org

hermetia illucens



30/06/2025

Physicochemical and Perceived Olfactory Changes in Black Soldier Fly (Hermetia illucens) Larvae Oil Under Domestic Cooking Temperatures - Chang et al.

The rapid growth and sustainable production of black soldier fly larvae (BSFL) contribute positively to the circular economy. This study profiled the fatty acid composition of crude BSFL oil, followed by an evaluation of its physicochemical properties under domestic cooking temperatures (up to 180 °C, 30 min). Odour evaluation of the BSFL oil was also performed using 10 trained panellists for attributes such as fishy, nutty, oily, ...

www.mdpi.com

hermetia illucens

30/06/2025

Insects in outer space: assessing the effects of microgravity on edible and model insect species for spaceflight food system - Guidetti et al.

Insects represent an extraordinary opportunity for human nutrition in extraterrestrial conditions. Therefore, the understanding of the effects of microgravit...

www.frontiersin.org

30/06/2025

BugBook: Why guidelines and standardization in insect research? - Deruytter et al.

"BugBook: Why guidelines and standardization in insect research?" published on 30 Jun 2025 by Wageningen Academic.

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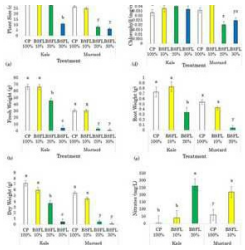

29/06/2025

Investigating Black Soldier Fly Larval (Hermetia illucens) Frass Applications as a Partial Peat Replacement and Liquid Fertilizer in Brassicaceae Crop Production - Chavez et al.

Insect frass is the left-over side stream from mass rearing insects as food and feed. Research indicates that black soldier fly, Hermetia illucens, larvae (BSFL) frass can improve the yield of leafy greens while also increasing nutrient uptake. Two studies evaluated the impact of BSFL frass on two Brassicaceae crops: kale (Brassica oleracea) and mustard (Sinapis alba). In Study 1, greenhouse potting mixes comprised of 10% BSFL ...

www.mdpi.com

hermetia illucens

27/06/2025

Country-Level Bibliometric Analysis of Edible Insect Research: Geographic Distribution and Contributions to Advancing Sustainable Alternatives for Food and Feed - Wardiman et al.

This study examines global research trends in edible insects using a bibliometric approach to evaluate country contributions, which are essential for understanding the geographic distribution of rese...

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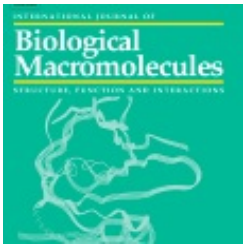

27/06/2025

Development of intelligent packaging films utilising chitosan derived from black soldier fly exuviae and anthocyanin from red dragon fruit peel for monitoring banana ripeness - Simon et al.

Bananas are often harvested in an underripe stage, making it crucial to identify the ideal time for consumption. Banana ripeness is generally determin...

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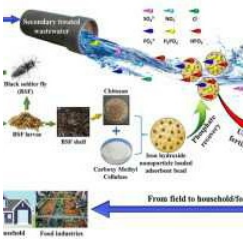
hermetia illucens



27/06/2025

Insect-derived chitosan for phosphate recovery and application as a sustainable fertilizer - Priya et al.

It is necessary to remove excessive phosphate in treated wastewater before its discharge into inland waters, as phosphate is known to cause eutrophica...

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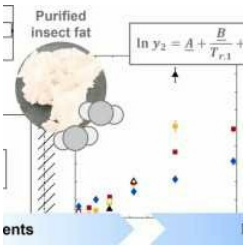

27/06/2025

Solubility of insect fat in compressed CO2: Experiments and density- as well as activity-based modeling - Goldberg et al.

As an important basis for the design of economic extraction processes, the solubility of insect fat in compressed CO2 was experimentally determined ov...

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27/06/2025

Protein recovery from black soldier fly larvae using enzymatic hydrolysis and alkaline extraction - Chakawa et al.

Abstract This study aimed to investigate optimum conditions for two-stage protein extraction from black soldier fly larvae (BSFL) using enzymatic hydrolysis at pH ranges 7–9 and 9–12 and determine the best two-stage protein extraction sequence that would produce the highest protein recovery. Enzymatic hydrolysis was performed using Alcalase 2.4L. Response surface methodology (RSM) was employed to optimize protein recovery, and ...

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hermetia illucens

26/06/2025

The integral role of the Black Soldier fly, Hermetia illucens L., microbiota in its life history - Ment et al.

The Black Soldier fly (BSF), Hermetia illucens, exhibits versatile bioconversion abilities and effectively transforms various waste materials into a nutritio...

www.frontiersin.org

hermetia illucens

26/06/2025

Yellow Mealworm Larvae Derived Eco-Friendly Substrates for Responsible Electronics - Gupta et al.

Electronic substrates composed of bioderived eco-friendly materials constitute a unique opportunity for the development of the next generation of responsible electronics. In this work, the use of Yel...

advanced.onlinelibrary.wiley.com

tenebrio molitor

26/06/2025

Protected black soldier fly larvae oil by calcium soap enhances rumen fermentation, gas production kinetics, and digestibility in vitro study - Albarki et al.

Abstract Black soldier fly larvae oil (BSFLO) is a potential energy source but has problems with rumen toxicity. Therefore, the oil must be protected to maintain its fat quality and prevent negative effects on the microbial population. Therefore, this study investigated the effect of BSFLO protected by calcium (Ca) soap on rumen fermentation, gas production kinetics, and digestibility through an in vitro study. This in vitro study ...

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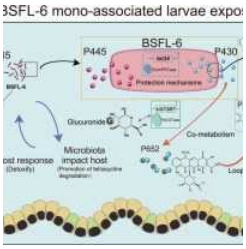
hermetia illucens



25/06/2025

Synergistic mechanism of tetracycline degradation by poor-degrading microbe Serratia marcescens cooperated with insect during environmental decomposition cycle - Yang et al.

The antibiotic residues in the environment disrupt ecological stability, ultimately pose potential risks to human health through the spread of the foo...

www.sciencedirect.com

24/06/2025

Assessing modifications on modern bone: contributions of a taphonomic experiment with Tenebrio molitor Linnaeus, 1758 (Insecta, Coleoptera, Tenebrionidae) - Fernandez et al.

In order to expand the knowledge about the taphonomic agents that can affect the archaeological and palaeontological record, especially the activity of specific bioturbating insects, we started obs...

www.tandfonline.com

tenebrio molitor

24/06/2025

BugBook: Considerations for designing and performing insect larvae production experiments - Deruytter et al.

Abstract This chapter of the BugBook provides guidance and addresses challenges towards conducting experiments that aim to optimize the production of insects for food and feed, focusing exclusively on Tenebrio molitor (yellow mealworm) and Hermetia illucens (black soldier fly). The goal is to improve the reliability, reproducibility, and efficiency of insect production experiments. This reduces the human and financial resources ...

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23/06/2025

Heat treatment of black soldier fly frass for soil amendment enhances Brassica rapa growth - Chia et al.

Abstract Insect frass, the residual product of mass-rearing insects for food and feed can be used as a soil amendment to fertilise the soil for crop growth. Heating frass before applying it to the field could be beneficial to enhance microbial safety and is required to align with EU regulatory standards before market placement as organic fertiliser. This study aimed to assess the effect of heat treatment of black soldier fly (BSF) ...

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hermetia illucens

20/06/2025

Environmental sustainability assessment of a biorefinery platform utilizing black soldier Fly larvae for organic waste valorization - Hosseingholilou et al.

The bioconversion of organic fraction of municipal solid waste (OFMSW) via black soldier fly larvae (BSFL) offers an efficient solution for sustainabl...

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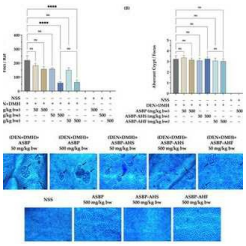
hermetia illucens



20/06/2025

Chemopreventive Effects of Bioactive Peptides Derived from Black Soldier Fly Larvae Protein Hydrolysates in a Rat Model of Early-Stage Colorectal Carcinogenesis - Praseatsook et al.

Bioactive peptides from black soldier fly larvae (BSFL) protein hydrolysates have gained attention for their health-promoting properties. Our previous study demonstrated the chemopreventive potential of BSFL hydrolysates prepared with Alcalase (ASBP-AH) in colon cancer cells; their in vivo efficacy has not been fully elucidated. This study evaluated the chemopreventive effects of ASBP-AH, processed by spray-drying (ASBP-AHS) or ...

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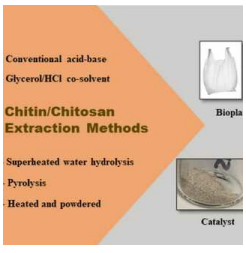
hermetia illucens



18/06/2025

Chitin and Chitosan Production from Black Soldier Fly Larvae (Hermertia illucens) as Bioresource: Current Progress, Applications, Challenges and Way Forwards - Liew et al.

Chitin and chitosan are highly sought after for their antimicrobial properties and versatile functionality. In the past, chitin is extracted mainly from crustacean sources. Nonetheless, the recent establishment of black soldier fly larvae (BSFL) production facilities offers an alternative source of insect-based chitin. The amount of BSFL chitin is anticipated to increase at a compound annual growth rate of 40.4% due to the demand ...

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hermetia illucens

14/06/2025

Creating Circular Economy of Waste Using Black Soldier Fly Larvae (BSFL) Technology - Mahmood

The currently used linear model of consumption “take-make-use-dispose” by the humans will not be workable for our common sustainable future. Circular economy is a sustainable competitive economy which ensures efficient use if resources and products for a...

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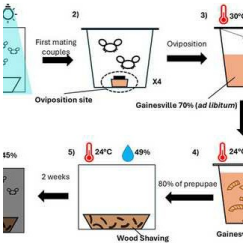
hermetia illucens



12/06/2025

Parentage assignment in black soldier fly (Hermetia illucens) using genotyping-by-sequencing - Dufresne et al.

Genetic selection to optimize economically important traits in black soldier flies (BSF), a major species in the insects as food and feed industry, continues...

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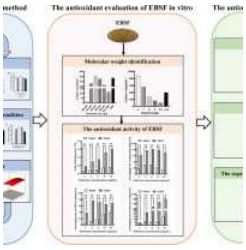
hermetia illucens



12/06/2025

The optimization of compound enzyme process for enzymatic hydrolyzate from black soldier fly (Hermetia illucens): Antioxidant and immune activity investigation in vitro and in vivo - Xu et al.

The black soldier fly (BSF) is a promising edible insect, recognized for its high nutritional value and beneficial health effects. This study was the ...

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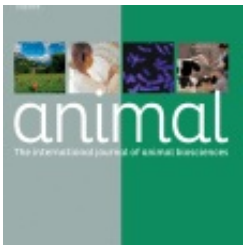
hermetia illucens



10/06/2025

Animal board invited review: The need for, and the path towards, a functional understanding of the farmed insect microbiome - Sibinga et al.

The rapid growth of research on industrially produced insect species over the past two decades has coincided with breakthroughs in the speed and affor...

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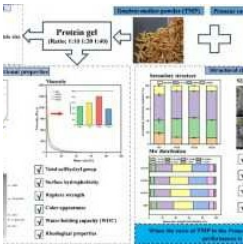

09/06/2025

Tenebrio molitor powder enhances gelation properties of Penaeus vannamei myofibrillar protein: Mechanistic insights into structural optimization and digestibility - Xu et al.

The study aimed to investigate how Tenebrio molitor powder (TMP) influences the gelation properties of Penaeus vannamei myofibrillar protein, specific...

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tenebrio molitor

05/06/2025

From Waste to Technological Products: Bioplastics Production from Proteins Extracted from the Black Soldier Fly - Di Pasquale et al.

The need to find sustainable solutions to conventional plastics has driven research into alternative materials, including bioplastics, which represent a promising option for reducing pollution and enhancing the value of renewable resources. In this study, bioplastics made from polyvinyl alcohol (PVA) and proteins extracted from the larvae of Black Soldier Fly (BSF), an insect capable of converting organic waste into high-value ...

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01/06/2025

Larval density drives thermogenesis and affects microbiota and substrate properties in black soldier fly trials - Klammsteiner et al.

Entomology; Microbiome; Biotechnology

www.cell.com

hermetia illucens

29/05/2025

Heat Treatment and Storage of Frass From Black Soldier Fly Larvae and Yellow Mealworm Production: Compliance With EU Regulation on Microbiological Quality and Safety - De Volder et al.

Microbiological quality/safety of frass from black soldier fly larvae and yellow mealworm production, before/after heat treatment and/or storage is determined by insect species, frass origin and bact...

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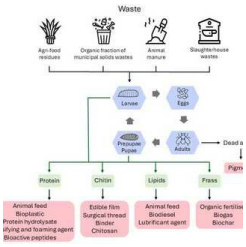
tenebrio molitor hermetia illucens



29/05/2025

Recent Developments, Challenges, and Environmental Benefits of Using Hermetia illucens for Bioenergy Production Within a Circular Economy Approach - Bataglia et al.

This study proposes a novel integrated biorefinery approach that combines Hermetia illucens (Black Soldier Fly) larvae treatment, anaerobic digestion (AD), and hydrothermal carbonization (HTC) to enhance the valorisation of fat-rich food residues. The process was designed to improve biogas yields while mitigating the inhibitory effects of lipid accumulation in AD systems. Results from larval bioconversion showed effective fat removal ...

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hermetia illucens

28/05/2025

Bugbook: Basic information and good practices on how to maintain stock populations for Tenebrio molitor and Hermetia illucens for research - Coudron et al.

Abstract The information on the production and reproduction of Tenebrio molitor and Hermetia illucens is essential for researchers pursuing a career in insect farming for food, feed and non-food applications. Rather than requiring researchers to sift through numerous studies to develop effective rearing protocols to maintain a stock population for experimental purposes, the authors summarized insights from peer-reviewed research, ...

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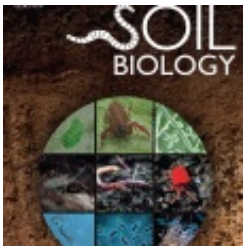
tenebrio molitor hermetia illucens



27/05/2025

Effects of black soldier fly larval frass addition on the winter wheat ecosystem: a mesocosm experiment - Goncharov et al.

Black Soldier Fly (Hermetia illucens) larval (BSFL) frass demonstrated a pronounced inhibitory effect in vitro on isolates of the soil-borne phytopath...

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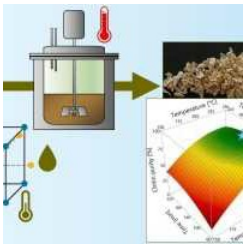
hermetia illucens



26/05/2025

Effect of process parameters on the purity of chitin isolated from black soldier fly larvae biomass using a subcritical methanol–water mixture - Vervoort et al.

Black soldier fly (BSF, Hermetia illucens) larvae efficiently convert low-value waste streams into high-value larval biomass, containing substantial a...

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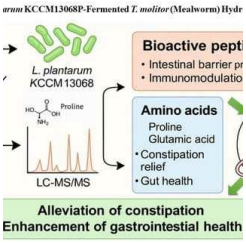
hermetia illucens



26/05/2025

Concurrent Hydrolysis–Fermentation of Tenebrio molitor Protein by Lactobacillus plantarum KCCM13068P Attenuates Inflammation in RAW 264.7 Macrophages and Constipation in Loperamide-Induced Mice - Jo et al.

Constipation is a common gastrointestinal disorder that negatively impacts quality of life and gut function. This study aimed to enhance the functional properties of Tenebrio molitor (mealworm) protein hydrolysates through fermentation with Lactobacillus plantarum KCCM13068P (TmLp). Compared to non-fermented hydrolysates (HeTm), TmLp exhibited improved protein hydrolysis and increased levels of amino acids associated with intestinal ...

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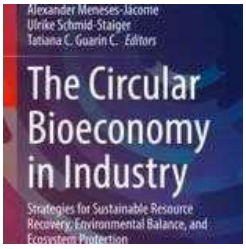
tenebrio molitor



24/05/2025

BioInsectonomy: A Circular Agrifood Economy Based on Insects as Animal Feed - Barragán-Fonseca

Given current ecological and economic unsustainability, there is a need to transition to circular agrifood systems, in which insects may play a significant role. Insects may be most efficiently incorporated into circular food systems by feeding the organic...

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24/05/2025

Multiple mating is not driven by size and sperm management in black soldier fly (Hermetia illucens) - Manas et al.

We investigated mating in black soldier fly (BSF), Hermetia illucens (Diptera: Stratiomyidae), an important source of animal feed. The number of spermatozoa stored in the spermathecae of females does...

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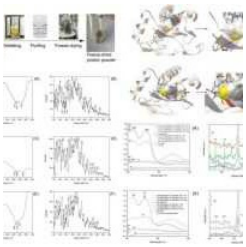
hermetia illucens



21/05/2025

Sulfur-containing amino acids enhanced antioxidant of yellow mealworm proteins: GPx4 activation through structural modulation evidenced by spectroscopy method - Cui et al.

Yellow mealworm protein demonstrated antioxidant properties characterized by cumene hydroperoxide radical scavenging activity and weak hydrogen peroxi...

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tenebrio molitor

21/05/2025

BugBook: life cycle, reproduction, and morphofunctional characterisation of the gut, fat body, and haemocytes in the black soldier fly - Bruno et al.

Abstract Insects are attracting significant attention due to their effectiveness as bioconversion agents for various organic waste and by-products, as well as for their use as raw material in the food and feed sector. Consequently, their potential in creating novel, circular, and sustainable supply chains has been extensively documented, leading to a rapid increase in research on the biology of these animals. In this scenario, ...

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20/05/2025

Screening optimum reference genes for quantitative real-time polymerase chain reaction analysis in black soldier fly Hermetia illucens under different conditions - Ma et al.

Cloning and sorting of cytochrome c oxidase subunit 1 (COI) genes of black soldier fly (BSF) collected from 15 regions, MEGA 6 was used to analyze the neighbor-joining tree between the obtained COI g...

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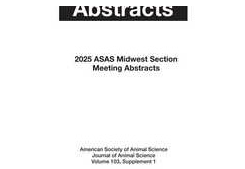
hermetia illucens



20/05/2025

Assessing the functional potential of black soldier fly (Hermetia illucens) larvae frass in nursery pigs - Rubio et al.

Abstract. Frass, a nutrient-rich byproduct of black soldier fly (Hermetia illucens) larvae production, consists of exoskeleton shedding, processed larvae,

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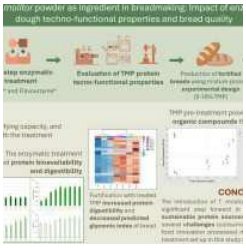
hermetia illucens



20/05/2025

Optimizing Tenebrio molitor powder as ingredient in breadmaking: Impact of enzymatic hydrolysis on dough techno-functional properties and bread quality - Verni et al.

Edible insects have garnered significant attention due to their potential to provide high-quality proteins, nevertheless, despite the appealing compos...

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tenebrio molitor

19/05/2025

Bridging lab and industry: The impact of a bio-conversion unit on black soldier fly larvae production and microbiome dynamics - Edwards et al.

Background This study evaluates the viability of a novel bio-conversion unit (BCU) for extensive black soldier fly larvae (BSFL) production as a sustainable feed additive for livestock. The BCU's ef...

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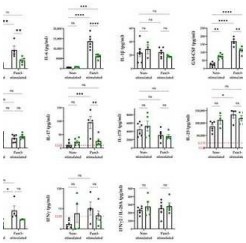
hermetia illucens



19/05/2025

Impact of Black Soldier Fly Larvae Oil on Immunometabolic Processes - Richter et al.

The oil extract derived from black soldier fly (Hermetia illucens) larvae (BSFL) is characterized by a distinctive fatty acid composition and bioactive compounds with demonstrated anti-inflammatory properties, as shown in our previous work. The present study aims to mechanistically explore the immunomodulatory effects of a saponified form of BSFL oil (MBSFL) and its potential interaction with metabolic signaling pathways. Using ...

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19/05/2025

Tracing the addition of black soldier fly larvae to barley flour using near infrared spectroscopy - Effects of batch and processing treatment - Čaloudová et al.

This study evaluated the ability of two near infrared (NIR) instruments (e.g. bench top and portable) combined with chemometrics (e.g. PCA and PLS reg...

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hermetia illucens

19/05/2025

Using black soldier fly larval frass to restore soil health - Jiang et al.

The importance of sustainable solutions for restoring soil health amidst increasing soil degradation and organic waste accumulation has gained signifi...

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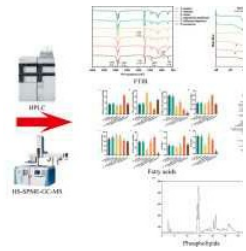

19/05/2025

Six edible insect oils extracted by ultrasound-assisted: Physicochemical characteristics, aroma patterns and antioxidant properties - Jiang et al.

Oils from six edible insect commercially available in China (Tenebrio molitor (T. molitor), Teleogryllus mitratus, Locusta migratoria manilensis, Cryp...

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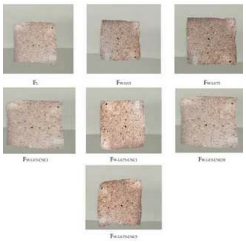
tenebrio molitor



17/05/2025

Innovation in Biodegradable Composites: Wheat Flour and Hermetia illucens Larvae Flour Biocomposites Enhanced with Cellulose Nanocrystals - Carmona-Cantillo et al.

The development of biocomposites derived from wheat flour and Hermetia illucens (black soldier fly) larvae flour presents a viable and sustainable alternative to conventional petroleum-based plastics, which contribute significantly to environmental degradation. The incorporation of cellulose nanocrystals (CNCs) is anticipated to enhance the functional properties of these materials, particularly for food packaging applications. ...

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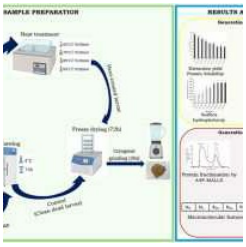
hermetia illucens



17/05/2025

Asymmetrical flow field-flow fractionation and multi-angle laser light scattering: A new analytical approach for the characterisation of insect protein aggregation/polymerisation after heat treatment of Tenebrio molitor larvae - Anouma et al.

Understanding the structural modifications of insect proteins during the transformation processes used for extract preparation is essential for optimi...

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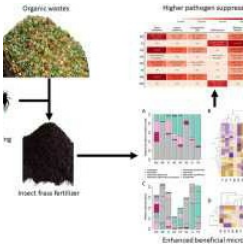

16/05/2025

Microbial composition and bioremediation in frass fertilizers from insect-based agri-food waste valorization - Gómez-Brandón et al.

Insect frass fertilizer is emerging as a sustainable and novel input for improving soil health and crop production; however, research attention on its...

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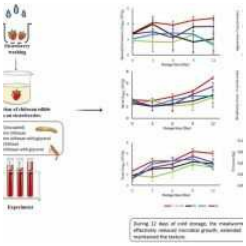

15/05/2025

Effect of mealworm (Tenebrio molitor L.) chitosan coating on the postharvest qualities of strawberries - Benashvili et al.

Edible coatings effectively preserve the freshness after harvest, and chitosan is a superior coating material that possesses antioxidant, antimicrobia...

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tenebrio molitor

14/05/2025

Automated detection of larval stages of the black soldier fly (Hermetia illucens Linnaeus) through deep learning augmented with optical flow - Manduca et al.

The black soldier fly (BSF) Hermetia illucens has garnered significant attention for its potential in sustainable waste management, nutrient recycling...

www.sciencedirect.com

hermetia illucens

14/05/2025

BugBook: Black soldier fly as a model to assess behaviour of insects mass produced as food and feed - Tomberlin et al.

Abstract Behavioural research and its applications has a rich history in science with direct applications continuing to expand global understanding of ecosystem function, structure, and evolution. The same can be said for such research as related to the applied sciences including entomology. The purpose of this chapter is to provide context to various approaches for assessing behaviour of insects that are mass produced for food ...

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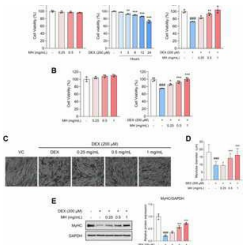
hermetia illucens



13/05/2025

Mealworm hydrolysate ameliorates dexamethasone-induced muscle atrophy via sirtuin 1-mediated signaling and Akt pathway - Kim et al.

Loss of skeletal muscle mass and strength can result from various factors, including malnutrition, glucocorticoid usage, and diseases. The mealworm (Tenebrio molitor larvae) is an edible insect gaining popularity as an alternative protein-rich diet. Mealworms are expected to help alleviate muscle atrophy based on their rich, high-quality protein and peptide content, but it remains unclear whether mealworms ameliorate muscle loss. ...

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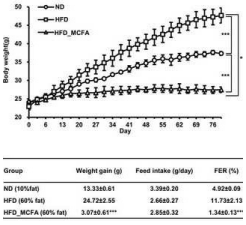

Group	Weight gain (g)	Feed intake (g/day)	FER (%)
ND (10%fat)	13.33±0.61	3.39±0.20	4.92±0.69
HFD (60% fat)	24.72±2.55	2.66±0.27	11.73±2.13
HFD_MCFA (60% fat)	3.07±0.61***	2.85±0.32	1.34±0.13***

10/05/2025

Medium-Chain Fatty Acids Extracted from Black Soldier Fly (Hermetia illucens) Larvae Prevents High-Fat Diet-Induced Obesity In Vivo in C57BL/6J Mice - Lee et al.

Obesity is a chronic disease associated with an increased dietary fat intake and reduced physical activity, posing significant health risks, including metabolic disorders, cardiovascular diseases, and diminished quality of life. This study investigated the anti-obesity potential of medium-chain fatty acids (MCFAs) derived from black soldier fly larvae (BSFL-MCFAs) in male C57BL/6J mice fed a high-fat diet (HFD). Lauric acid (>50% ...

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hermetia illucens

10/05/2025

Black soldier fly larvae oil as a potential nutraceutical ingredient in diets for hybrid catfish Ictalurus punctatus × I. furcatus juveniles - Farias et al.

The present study evaluated the potential of black soldier fly larvae (BSFL) oil as a substitute for catfish oil in diets of hybrid catfish juveniles....

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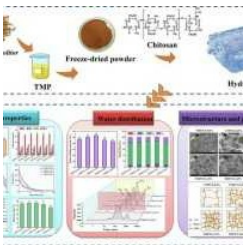
hermetia illucens



09/05/2025

Inclusion of chitosan in Tenebrio molitor larva protein hydrogels improved the rheological and gel properties of the composite hydrogels - Liu et al.

Tenebrio molitor protein (TMP) is a highly promising alternative protein resource. However, hydrogels formed from TMP alone typically exhibit fragilit...

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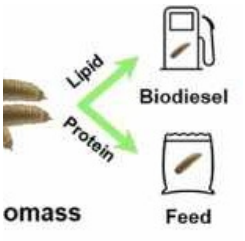
tenebrio molitor



07/05/2025

Enhancing sustainability in meat production through insect biorefinery - Kim et al.

Valuable feed crops and fossil fuel energy are used to produce animal meat. To become sustainable, meat production methods must adapt to include non-food substrates and renewable fossil-fuel alternatives. We evaluated the potential of protein livestock feed and biodiesel production through insect biorefining. The bioconversion efficiency of organic waste into black soldier fly larvae (BSFL) biomass was 32.0–35.8% after 24 d. The ...

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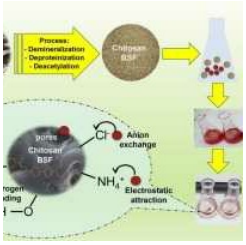

06/05/2025

Evaluating the efficiency and scalability of chitosan from black soldier fly in removing Congo red from wastewater - Hevira et al.

This study investigated chitosan extracted from black soldier fly (BSF) exuviae for Congo Red (CR) removal from wastewater and assessed its cost-effec...

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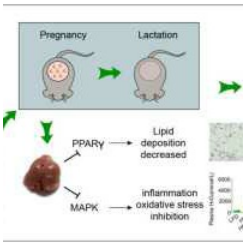

06/05/2025

Black soldier fly larvae oil: A functional lipid that improves insulin sensitivity mainly by inhibiting the PPAR and MAPK signaling - Peng et al.

Black soldier fly larvae (BSFL) contains various functional components such as larva oil, but their nutritional efficacy still have not been well defi...

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06/05/2025

Volatile compound profiling and quality insights of edible insect oils analysed by headspace-solid-phase microextraction-Arrow-gas chromatography-mass spectrometry - Jang et al.

Abstract Lipids are usually removed during protein extraction from edible insects. The use of these lipids as oils may be environmentally friendly. In this study, the Box–Behnken design of response surface methodology was employed to optimise the ultrasound-assisted extraction (UAE) of insect oils (Tenebrio molitor, Gryllus bimaculatus, Locusta migratoria, and Zophobas atratus oils). Volatile compounds were analysed using the headspace ...

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05/05/2025

Integrating regional survey data into life cycle assessment: prospective environmental consequences of directing apple pomace to insect farming - Güldemund et al.

Purpose Insect cultivation on bio-residues exemplifies the circular bioeconomy (CBE) concept by integrating three core CBE strategies: the use of bio-residues, multi-output production chains, and cascading. The sustainability of CBE technologies using bio-residues needs to be evaluated on a case-by-case basis, taking into account regional aspects and the technologies' future potential. This study provides methodological guidance ...

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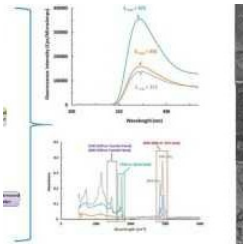

05/05/2025

Physicochemical, nutritional and structural properties of mealworm powders manufactured by using different technological processes - Karoui et al.

Due to the growing concerns over the sustainability of traditional protein sources, edible insects such as Tenebrio molitor (T. molitor) are gaining a...

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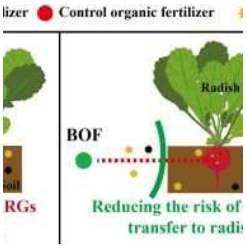
tenebrio molitor



03/05/2025

Mitigating the transfer risk of antibiotic resistance genes from fertilized soil to cherry radish during the application of insect fertilizer - Zhao et al.

The transfer of antibiotic resistance genes (ARGs) from fertilized soil to vegetables, particularly those consumed raw, causes significant public heal...

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01/05/2025

Artificial light source combined with functional microorganism improves reproductive performance of black soldier fly - Zhang et al.

Homemade artificial light (HM-LED) significantly improved the mating rate of black soldier fly (BSF) compared to commercial artificial light (CM-LED) and 2,5-dimethylpyrazine produced by the BSFL-2 s...

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hermetia illucens

01/05/2025

The genomic landscape of Hermetia illucens: exploring the potential of the black soldier fly through molecular insights - Muchina et al.

Abstract The black soldier fly (BSF), Hermetia illucens, has garnered significant attention recently due to its potential applications in waste management, animal feed production, frass fertilizer production, and biotechnology. Despite its numerous advantages, genomic resources for BSF remain limited, underscoring the necessity for continued genomic exploration. This review provides a comprehensive overview of the genomic landscape ...

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hermetia illucens

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- Can InsectBiotech crack the code on insect ag economics by tapping into Spain’s olive waste? - AgFunderNews

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- Evaluation of various diets for improved growth, reproductive and nutritional value of the yellow mealworm, Tenebrio molitor L. - Mahmoud et al.
- Valorizing poultry by-products in mealworm production: nutritional and microbiological insights on Tenebrio molitor meal - de Oliveira et al.

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- Consumer “disgust” and investment barriers deter widespread insect protein adoption, finds study
- Goterra marks milestone with first large-scale insect protein rendering trial
- Volare secures €26m funding to transform insect protein production in Europe | FoodBev Media
- Why insect protein is the future of sustainable food
- Aquafeed.com | Insect meal as aquafeed in Africa: It’s a matter of scale

Product - articles

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- Enhanced Nile tilapia meat quality by the metabolomic effects of Tenebrio molitor larval meal dietary supplement - Liu et al.
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- Replacing fishmeal with an insect meal blend: Implications for intestinal microbiota in European seabass - Kalemi et al.
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- Black Soldier Fly Larvae Meals With and Without Stickwater Highly Utilized in Freshwater by Atlantic salmon (Salmo salar) Parr - Bogevik et al.
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Industrial applications - media

- Insect-Based Livestock Feed
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- Tenebrio molitor powder enhances gelation properties of Penaeus vannamei myofibrillar protein: Mechanistic insights into structural optimization and digestibility - Xu et al.
- From Waste to Technological Products: Bioplastics Production from Proteins Extracted from the Black Soldier Fly - Di Pasquale et al.
- Larval density drives thermogenesis and affects microbiota and substrate properties in black soldier fly trials - Klammsteiner et al.
- Heat Treatment and Storage of Frass From Black Soldier Fly Larvae and Yellow Mealworm Production: Compliance With EU Regulation on Microbiological Quality and Safety - De Volder et al.
- Recent Developments, Challenges, and Environmental Benefits of Using Hermetia illucens for Bioenergy Production Within a Circular Economy Approach - Bataglia et al.
- Bugbook: Basic information and good practices on how to maintain stock populations for Tenebrio molitor and Hermetia illucens for research - Coudron et al.
- Effects of black soldier fly larval frass addition on the winter wheat ecosystem: a mesocosm experiment - Goncharov et al.
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- BioInsectonomy: A Circular Agrifood Economy Based on Insects as Animal Feed - Barragán-Fonseca
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- Optimizing Tenebrio molitor powder as ingredient in breadmaking: Impact of enzymatic hydrolysis on dough techno-functional properties and bread quality - Verni et al.
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- Asymmetrical flow field-flow fractionation and multi-angle laser light scattering: A new analytical approach for the characterisation of insect protein aggregation/polymerisation after heat treatment of Tenebrio molitor larvae - Anouma et al.
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