Newsletter N°9 on Insects for feed, food and bioconversion of organic substrates

Items published between 01 April and 31 May 2024

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

- Diversifying into insect farming - All About Feed
- Insect farming dispute: Alternative protein pathway or industrialized animal suffering?
- Insect producer Innovafeed opens innovation centre in USA - All About Feed
- Modular Insect Farms Successfully Turn Organic Waste Into Sustainable Protein
- Aquafeed.com | Spanish insect company starts insect meal production
- Kelp could improve the nutritional value of insect meal | Feed Strategy

Substrate - articles

- Optimizing polystyrene degradation, microbial community and metabolite analysis of intestinal flora of yellow mealworms, Tenebrio molitor - Matyakubov
- Generation and Fate of Nanoplastics in the Intestine of Plastic-Degrading Insect (Tenebrio molitor Larvae) during Polystyrene Microplastic Biodegradation - Peng et al.
- Mitigation Strategies against Food Safety Contaminant Transmission from Black Soldier Fly Larva Bioconversion - Shelomi
- The nutritional profile of the yellow mealworm larvae (Tenebrio molitor) reared on four different substrates - Langston et al.
- Effect of different diet composition on the fat profile of two different Black Soldier Fly larvae populations - Tognocchi et al.
- Microbial dynamics and vertical transmission of Escherichia coli across consecutive life stages of the black soldier fly (Hermetia illucens) - Van Looveren et al.

- Wild black soldier flies, Hermetia illucens (Diptera: Stratiomyidae): Seasonal availability and life history traits in two common organic streams in Bangladesh - Ferdousi et al.
- Developing an environmental assessment framework for an insect farm operating in circular economy: The case study of a Montréal (Canada) mealworm farm - Paris et al.
- Development of the edible Tenebrio molitor at different temperatures: a Poisson log-linear regression modeling approach - Kavallieratos et al.
- Performance of Hermetia illucens (Diptera: Stratiomyidae) larvae reared on organic waste diets and pupal chitin and chitosan yield - Adamaki-Sotiraki et al.
- Evaluation of the Microbial Quality of Hermetia illucens Larvae for Animal Feed and Human Consumption: Study of Different Type of Rearing Substrates - Brulé et al.
- The role of larvae of black soldier fly and house fly and of feed substrate microbes in biotransformation of aflatoxin B1 - Niermans et al.
- Biodegradation of Polystyrene by Plastic-Eating Tenebrionidae Larvae - Di Liberto et al.
- Valorization of local agricultural by-products as nutritional substrates for Tenebrio molitor larvae: A sustainable approach to alternative protein production - Vrontaki et al.
- Effects of aflatoxin B1 on metabolism- and immunity-related gene expression in Hermetia illucens L. (Diptera: Stratiomyidae) - Shah et al.
- Vertebrates and flying insects provide biocontrol services to Australian urban food gardens - McDougall et al.
- Evaluation of lauric acid enhancement of black soldier fly larvae from coconut - Gatlin et al.
- Effects of high doses of zearalenone on some antioxidant enzymes and locomotion of Tenebrio molitor larvae (Coleoptera: Tenebrionidae) - Janković-Tomanić et al.
- Mealworm (Tenebrio molitor) rearing and growth optimization as a sustainable food source using various larval diets under laboratory conditions - Shah et al.
- Hemolymph metabolism of black soldier fly (Diptera: Stratiomyidae), response to different supplemental fungi - Kannan et al.
- Black soldier fly-based bioconversion of biosolids: Microbial community dynamics and fate of antibiotic resistance genes - Bohm et al.
- Bioconversion of organic waste by insects – A comprehensive review - Siddiqui et al.
- Effect of Sample Presentation on the Classification of Black Soldier Fly Larvae Using Near-Infrared Spectroscopy - Sanchez et al.
- Degradation of edible mushroom waste by Hermetia illucens L. and consequent adaptation of its gut microbiota - Lai et al.
- Metabolic performance and feed efficiency of black soldier fly larvae - Eriksen
- Biodegradation of polystyrene nanoplastics by Achromobacter xylosoxidans M9 offers a mealworm gut-derived solution for plastic pollution - El-Kurdi et al.
- Radical innovation breakthroughs of biodegradation of plastics by insects: history, present and future perspectives - Yang et al.
- Assessing Substrate Utilization and Bioconversion Efficiency of Black Soldier Fly (Hermetia illucens) Larvae: Effect of Diet Composition on Growth and Development Temperature - Belperio et al.
- Evaluating the Efficiency of Black Soldier Fly (Hermetia illucens) Larvae in Converting Mackerel Head Waste into Valuable Resources - Tirtawijaya et al.
- Black soldier fly larvae mitigate greenhouse gas emissions from domestic biodegradable waste by recycling carbon and nitrogen and reconstructing microbial communities - Xiang et al.
- Responses of physiological, microbiome and lipid metabolism to lignocellulose wastes in gut of yellow mealworm (Tenebrio molitor) - Mao et al.
- Use of irradiation against stored product insect species that infest edible insect rearing - Sileem et al.
- Framework for valorizing waste- and by-products through insects and their microbiomes for food and feed - Muurmann et al.
- Evaluation of the decomposition ability and characteristics of pig manure treated with different larval instar stages of black soldier fly (Hermetia illucens L.) - Choi
- Validation of Diets with Tomato Pomace in Complete Cycle Breeding of Tenebrio molitor (L.) (Coleoptera: Tenebrionidae) - Baldacchino et al.
- Performance of feeding black soldier fly (Hermetia illucens) larvae on shrimp carcasses: A green technology for aquaculture waste management and circular economy - Hu et al.
- The juvenile hormone analogue, pyriproxifen, alters protein and fat composition of Tenebrio molitor larvae - Hill et al.
- Exposure to entomopathogenic fungus and high larval density induce a strong immune response and life-history costs in black soldier fly, a commercially important insect - Opare et al.
- How to reduce waste using black soldier fly larvae and produce a high-quality product - Ben-Mordechay et al.

- Canteen waste as food for black soldier fly larvae: risk of heavy metals accumulation? Variability during one year of rearing - Grosso et al.
- Reproductive output and other adult life-history traits of black soldier flies grown on different organic waste and by-products - Laursen et al.
- Biodegradation of aged polyethylene (PE) and polystyrene (PS) microplastics by yellow mealworms (Tenebrio molitor larvae) - Wang et al.
- Biodegradation of various grades of polyethylene microplastics by Tenebrio molitor and Tenebrio obscurus larvae: Effects on their physiology - Ding et al.
- Effects of treatment process on larvae growth performance and nutrient yield during cyanobacteria bioconversion by black soldier fly - Gu et al.
- Molecular-Weight-Dependent Degradation of Plastics: Deciphering Host–Microbiome Synergy Biodegradation of High-Purity Polypropylene Microplastics by Mealworms - He et al.

Product - media

- Insect Protein as an Eco-Friendly Pet Food Solution Feeding Fido Sustainably
- Portuguese companies introduce new petfood with insect protein
- Insect protein scale-up Goterra signs breakthrough offtake deal with fish feed group Skretting
- Aquafeed.com | Live insects in animal feed: What European regulation says
- French insect protein group plans further overseas growth
- 9 key considerations when raising insects for feed
- Investing in Sustainability: Insect Feed Industry Predicted to Witness Rapid Growth
- Alimentation animale : les insectes, une solution durable et innovante
- Eco India: A new buzzword for a protein rich animal feed: Insect farming - Scroll.in
- Innovafeed aims to advance sustainable insect protein production in North America
- Maltento focused on insect innovation for pet and aqua feed - FeedNavigator.com
- Insect meal as a tool for reducing the environmental impact of livestock production
- Protix hails insect meal lifecycle assessment versus other proteins
- Feed & Food Show 2024 to shine light on insects as sustainable feed ingredients
- Insect Farm Hatches Plan for Greener Animal Feed for Chickens and Pigs
- Making Aquaculture More Sustainable: Marubeni Farms Yellowtail on Insect-Based Feed
- Aquafeed.com | Skretting Chile adopts insect meal into its salmon aquafeeds

Product - articles

- Insect live larvae as a new nutritional model in duck: effects on gut health - Colombino et al.
- Dietary black soldier fly oil enhances growth performance, flesh quality, and health status of largemouth bass (Micropterus salmoides) - Yuan et al.
- Nutritive value of feed substrate waste from black soldier fly larvae production, and its potential as an aquafeed ingredient - Thongprajukaew et al.
- The effect of fishmeal replacement with organic acid fermented black soldier fly (Hermetia illucens) larvae meal on growth, nutrient utilization, metabolic enzyme activity, antioxidant status and immunity in Pangasius (Pangasianodon hypophthalmus) - Ardra et al.
- Whole dried black soldier fly (Hermetia illucens) larvae are acceptable, palatable, and do not negatively affect health when fed to healthy, adult horses at low inclusion rates - Burron et al.
- Defatted or hydrolyzed black soldier fly larvae have sufficient potential as an alternative to fishmeal for weaned pigs - Chang et al.
- Dried crickets (Gryllus sigillatus) or black soldier fly (Hermetia illucens) larvae meal for broiler chickens: nutrient composition and digestibility - Fisher et al.
- Multi-trait genetic parameter estimates in a Tenebrio molitor reference population: high potential for breeding gains - Sellem et al.
- Excessive level of dietary insect protein negatively changed growth metabolomic and transcriptomic profiles of largemouth bass (Micropterus salmoides) - Sun et al.
- Partial Replacement of Fishmeal with Black Soldier Fly Larvae Meal in Nile Tilapia Diets Improves Performance and Profitability in Earthen Pond - Kariuki et al.
- Protein requirements of large yellow croaker Larimichthys crocea depends on protein sources from the perspective of growth performance, digestive and absorptive enzyme activities, intestinal and liver histology - Huangfu et al.
- Physiological Response of European Sea Bass (Dicentrarchus labrax) Juveniles to an Acute Stress Challenge: The Impact of Partial and Total Dietary Fishmeal Replacement by an Insect Meal - Basto et al.

- Assessing the Socio-Economic Benefits and Costs of Insect Meal as a Fishmeal Substitute in Livestock and Aquaculture - Auzins et al.
- Growth, Hepatic Enzymatic Activity, and Quality of European Seabass Fed on Hermetia illucens and Poultry By-Product Meal in a Commercial Farm - Pulido-Rodriguez et al.
- Lauric acid content in intramuscular fat is a reliable indicator of black soldier fly larvae meal consumption in Muscovy ducks - Martinez Marin et al.
- PSIV-A-11 Potential of black soldier fly (Hermetia illucens) larvae frass as a functional ingredient for nursery pigs - Rubio et al.
- Defatted Tenebrio molitor meal time-dependently altered sensory quality and nutritional value of turbot Scophthalmus maximus during growing-out phase - Qi et al.
- Apparent total tract digestibility of calcium and phosphorus from partially defatted Hermetia illucens larvae meal in pigs - Grundmann et al.
- Defatted black soldier fly larvae meal in lactating sow and pre-weaning piglet diets: impacts on growth performance, fecal microbiota, and metabolic pathways - Zhao et al.
- Live yellow mealworm (Tenebrio molitor) larvae: a promising nutritional enrichment for laying quails - Dalle Zotte et al.
- Dietary Tenebrio molitor larvae meal effects on cellular stress responses, antioxidant status and intermediate metabolism of Oncorhynchus mykiss - Feidantsis et al.
- Use of black soldier fly larvae and freshwater shrimp to partly substitute commercial diet for Nile tilapia cultured in smallholder fish farms – A case study in Busia County, Kenya - Kals et al.
- Robustness of business models for insect production for feed and food in Europe - Niyonsaba et al.
- Black soldier fly larvae meal in an extruded food: effects on nutritional quality and health parameters in healthy adult cats - Bosch et al.
- A Sustainable Diet for Tambaqui Farming in the Amazon: Growth Performance, Hematological Parameters, Whole-Body Composition and Fillet Color - de Matos Dantas et al.
- Antibiotic Resistance in Enterococci and Enterobacteriaceae from Laboratory-Reared Fresh Mealworm Larvae (Tenebrio molitor L.) and Their Frass - Turchi et al.
- Utility of by-products of black soldier fly larvae (Hermetia illucens) production as feed ingredients for Pacific Whiteleg shrimp (Litopenaeus vannamei) - Fricke et al.

Industrials applications - media

- Insect frass becomes food for protein-rich microalgae
- Fine dining or a bush tucker trial? I tried eating insects — with surprising results
- Disgust still poses major barrier to adoption of insect protein
- Insect Protein Industry to Showcase Continued Growth in the Coming Years
- Insect protein for companion animals: Hill’s Pet Nutrition sees great potential
- Why education is key to promoting insects as food and feed

Industrials applications - articles

- Insect flour as milk protein substitute in fermented dairy products - Neves et al.
- Development of a lexicon for the sensory description of edible insects commercially available in Australia - Bless et al.
- Conversion of protein-rich waste into biodiesel by Hermetia illucens: Enhanced energy recovery and reduced greenhouse gas emissions - Elsayed et al.
- Analysis of yellow mealworm (Tenebrio molitor) frass as a resource for a sustainable agriculture in the current context of insect farming industry growth - Zunzunegui et al.
- Determination of Triacylglycerol Composition in Mealworm Oil (Tenebrio molitor) via Electrospray Ionization Tandem Mass Spectrometry with Multiple Neutral Loss Scans - Lee et al.
- Antibacterial properties of oil extracts of black soldier fly larvae reared on bread waste - Shu et al.
- Recombinant Chymotrypsin-like Peptidase from Tenebrio molitor with a Non-Canonical Substrate-Binding Site - Tereshchenkova et al.
- A novel family of defensin-like peptides from Hermetia illucens with antibacterial properties - Fahmy et al.
- Detection of edible insect as a component of snack bars using histochemical method - Pečová et al.
- Impacts of black soldier fly, Hermetia illucens, larval frass on lettuce and arugula production - Chavez et al.
- Effect of Fiber and Insect Powder Addition on Selected Organoleptic and Nutritional Characteristics of Gluten-Free Bread -Tauferova et al.
- Hermetia illucens larvae fat vs coconut oil to obtain free lauric acid-rich products by chemical or enzymatic hydrolysis - Vázquez et al.
- How the presence of residual lipids in a yellow mealworm protein concentrate affects its foaming properties? - Berthelot et al.

- Innovative Applications of Tenebrio molitor Larvae in the Production of Sustainable Meat Sausages: Quality and Safety Aspects - Jankauskienė et al.
- Edible insects as a novel source of lecithin: Extraction and lipid characterization of black soldier fly larvae and yellow mealworm - Li et al.
- In silico identification and expression analysis of superoxide dismutases in Tenebrio molitor- Jang et al.
- Unveiling Environmental Influences on Sustainable Fertilizer Production through Insect Farming - Katchali et al.
- Sourcing chitin from exoskeleton of Tenebrio molitor fed with polystyrene or plastic kitchen wrap - Ilijin et al.
- The Potential of Black Soldier Fly Frass to Revitalise Marginal Soils - Mubekaphi et al.
- Isolation of Chitosan-Melanin Complex from Black Soldier Fly Adults and Obtaining Nanofibrous Materials Based on It - Khayrova et al.
- Larval Frass of Hermetia illucens as Organic Fertilizer: Composition and Beneficial Effects on Different Crops - Lomonaco et al.
- Dried Porous Biomaterials from Mealworm Protein Gels: Proof of Concept and Impact of Drying Method on Structural Properties and Zinc Retention - Klost et al.
- Production, characterisation, and biological properties of Tenebrio molitor-derived oligopeptides - Gonzalez-de la Rosa et al.
- Molecular Characterization of the Allergenic Arginine Kinase from the Edible Insect Hermetia illucens (Black Soldier Fly) - Delfino et al.
- Valorization of Hermetia illucens breeding rejects by chitins and chitosans production. Influence of processes and life cycle on their physicochemical characteristics - Elkadaoui et al.
- Gamma ray irradiation enhances defatted Hermetia illucens larvae meal as a dietary alternative to fishmeal for Acanthopagrus schlegelii juveniles - Ren et al.
- Microbial community dynamics during decomposition of insect exuviae and frass in soil - Nurfikari et al.
- Computational modelling of extrusion process temperatures on the interactions between black soldier fly larvae protein and corn flour starch - Gamero-Barraza et al.
- Bioconversion approach for the valorization of Jatropha curcas seed cake into biodiesel using black soldier fly (Hermetia illucens) larvae - Wandji Nono et al.

Substrate - media

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

30/05/2024

Diversifying into insect farming - All About Feed

Diversifying into insect farming All About Feed

consent.google.com

hermetia illucens

06/05/2024

Insect farming dispute: Alternative protein pathway or industrialized animal suffering?

Contestation de l'élevage d'insectes : Voie alternative de protéines ou souffrance animale industrialisée ?

www.foodingredientsfirst.com

hermetia illucens tenebrio molitor

23/04/2024

Insect producer Innovafeed opens innovation centre in USA - All About Feed

Insect producer Innovafeed opens innovation centre in USA All About Feed

www.allaboutfeed.net

hermetia illucens

09/04/2024

Modular Insect Farms Successfully Turn Organic Waste Into Sustainable Protein

London, UK – Flybox, a pioneer in sustainable agriculture, proudly announces the successful deployment of its innovative modular insect farms, ...

www.pressrelease.cc

08/04/2024

Aquafeed.com | Spanish insect company starts insect meal production

Once the works have been completed and the necessary authorization has been obtained, the facilities in Galicia will produce 12,000 tonnes of ...

www.aquafeed.com

hermetia illucens

02/04/2024

Kelp could improve the nutritional value of insect meal | Feed Strategy

A study focused on marine byproducts determined that raising insects on seaweed could improve the nutritional content of insect meal.

www.feedstrategy.com

hermetia illucens

Substrate - articles

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

30/05/2024

Optimizing polystyrene degradation, microbial community and metabolite analysis of intestinal flora of yellow mealworms, Tenebrio molitor - Matyakubov

This study explored a direct feeding of expanded polystyrene as the sole diet for breeding Tenebrio molitor larvae. Temperature and relative humidity ...

www.sciencedirect.com

tenebrio molitor

30/05/2024

Generation and Fate of Nanoplastics in the Intestine of Plastic-Degrading Insect (Tenebrio molitor Larvae) during Polystyrene Microplastic Biodegradation - Peng et al.

The insect Tenebrio molitor exhibits ultrafast efficiency in biodegrading polystyrene (PS). However, the generation and fate of nanoplastics (NPs) in the intestine during plastic biodegradation remain unknown. In this study, we investigated ...

pubs.acs.org

28/05/2024

Mitigation Strategies against Food Safety Contaminant Transmission from Black Soldier Fly Larva Bioconversion - Shelomi

The black soldier fly larva, Hermetia illucens, can efficiently convert organic waste into biomatter for use in animal feed. This circularity comes with a risk of contaminating downstream consumers of the larval products with microbes, heavy ...

www.mdpi.com

hermetia illucens

27/05/2024

The nutritional profile of the yellow mealworm larvae (Tenebrio molitor) reared on four different substrates - Langston et al.

The utilisation of Tenebrio molitor L. (the yellow mealworm) as a cheaper, alternative and readily available ingredient for food and feed is gaining i...

www.sciencedirect.com

tenebrio molitor

27/05/2024

Effect of different diet composition on the fat profile of two different Black Soldier Fly larvae populations - Tognocchi et al.

Black soldier fly larvae (Hermetia illucens; BSFL) can transform organic wastes into nutritional biomass useful in animal feeding. The aim of this wor...

www.sciencedirect.com

hermetia illucens

26/05/2024

Microbial dynamics and vertical transmission of Escherichia coli across consecutive life stages of the black soldier fly (Hermetia illucens) - Van Looveren et al.

The black soldier fly (BSF, Hermetia illucens L.) is one of the most promising insects for bioconversion of organic waste, which often carry a high microbial load with potential foodborne pathogens. Although horizontal transmission (from rearing substrate to larvae) has been extensively studied, less is known about vertical transmission of microorganisms, and particularly of foodborne pathogens, across different BSF life stages.

link.springer.com

hermetia illucens

23/05/2024

Wild black soldier flies, Hermetia illucens (Diptera: Stratiomyidae): Seasonal availability and life history traits in two common organic streams in Bangladesh - Ferdousi et al.

The black soldier fly (BSF) Hermetia illucens (L.) (Diptera: Stratiomyidae) is a “crown jewel” in waste management because it rapidly bioconverts orga...

www.sciencedirect.com

hermetia illucens

23/05/2024

Developing an environmental assessment framework for an insect farm operating in circular economy: The case study of a Montréal (Canada) mealworm farm - Paris et al.

Publication date: 1 July 2024Source: Journal of Cleaner Production, Volume 460Author(s): Nicolas Paris, Alexis Fortin, Noémie Hotte, Aliyeh Rasooli Zadeh, Sourabh Jain, Louise Hénault-Ethier

www.sciencedirect.com

tenebrio molitor hermetia illucens

21/05/2024

Development of the edible Tenebrio molitor at different temperatures: a Poisson log-linear regression modeling approach - Kavallieratos et al.

Tenebrio molitor gained recognition for its nutritional value for human and/or animal consumption, its utilization as a model species in research studies, and its ability to degrade many types of plastics. However, it is a stored-product pest ...

link.springer.com

tenebrio molitor

21/05/2024

Performance of Hermetia illucens (Diptera: Stratiomyidae) larvae reared on organic waste diets and pupal chitin and chitosan yield - Adamaki-Sotiraki et al.

Recently, much research has been oriented towards the influence of different food wastes and agricultural by-products on the final larval biomass and chemical composition of the insect species Hermetia illucens L. (Diptera: Stratiomyidae). However, ...

link.springer.com

hermetia illucens

20/05/2024

Evaluation of the Microbial Quality of Hermetia illucens Larvae for Animal Feed and Human Consumption: Study of Different Type of Rearing Substrates - Brulé et al.

In the context of climate change and depletion of natural resources, meeting the growing demand for animal feed and human food through sufficient, nutritious, safe, and affordable sources of protein is becoming a priority. The use of Hermetia ...

www.mdpi.com

hermetia illucens

17/05/2024

The role of larvae of black soldier fly and house fly and of feed substrate microbes in biotransformation of aflatoxin B1 - Niermans et al.

Over the past few years, there has been growing interest in the ability of insect larvae to convert various organic side-streams containing mycotoxins...

www.sciencedirect.com

hermetia illucens

15/05/2024

Biodegradation of Polystyrene by Plastic-Eating Tenebrionidae Larvae - Di Liberto et al.

Polystyrene (PS) is an extremely stable polymer with a relatively high molecular weight and a strong hydrophobic character that makes it highly resistant to biodegradation. In this study, PS was subjected to biodegradation tests by Tenebrio ...

www.mdpi.com

tenebrio molitor

14/05/2024

Valorization of local agricultural by-products as nutritional substrates for Tenebrio molitor larvae: A sustainable approach to alternative protein production - Vrontaki et al.

In pursuit of sustainable protein sources, the agricultural sector and emerging edible insect industry intersect in the valorization of agricultural by-products. Establishing a mutually beneficial relationship involves utilizing agricultural ...

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tenebrio molitor

13/05/2024

Effects of aflatoxin B1 on metabolism- and immunity-related gene expression in Hermetia illucens L. (Diptera: Stratiomyidae) - Shah et al.

Contamination of food products with mycotoxins such as aflatoxin B1 (AFB1) poses a severe risk to human health. Larvae of the black soldier fly (BSFL)...

www.sciencedirect.com

hermetia illucens

13/05/2024

Vertebrates and flying insects provide biocontrol services to Australian urban food gardens - McDougall et al.

Biocontrol by wild insects and other organisms is an important service provided to agriculture, but few studies have linked the role of this service to urban garden crop production. In 15 urban food gardens in Sydney, Australia, we assessed ...

link.springer.com

tenebrio molitor

08/05/2024

Evaluation of lauric acid enhancement of black soldier fly larvae from coconut - Gatlin et al.

Abstract. The current study evaluated the potential enhancement of lauric acid (LA) in black soldier fly, Hermetia illucens, (L.) (Diptera: Stratiomyidae)

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hermetia illucens

08/05/2024

Effects of high doses of zearalenone on some antioxidant enzymes and locomotion of Tenebrio molitor larvae (Coleoptera: Tenebrionidae) - Janković-Tomanić et al.

Abstract. The mealworm Tenebrio molitor L. (Coleoptera: Tenebrionidae) feeds on wheat bran and is considered both a pest and an edible insect. Its larvae c

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tenebrio molitor

08/05/2024

Mealworm (Tenebrio molitor) rearing and growth optimization as a sustainable food source using various larval diets under laboratory conditions - Shah et al.

The rearing and growth optimization of mealworms, Tenebrio molitor (Coleoptera: Tenebrionidae), as a sustainable food source were investigated under laboratory conditions. Ten larval diets, varying i...

onlinelibrary.wiley.com

tenebrio molitor

07/05/2024

Hemolymph metabolism of black soldier fly (Diptera: Stratiomyidae), response to different supplemental fungi - Kannan et al.

Abstract. The black soldier fly, Hermetia illucens L. (Diptera: Stratiomyidae), is commonly used for organic waste recycling and animal feed production. Ho

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hermetia illucens

02/05/2024

Black soldier fly-based bioconversion of biosolids: Microbial community dynamics and fate of antibiotic resistance genes - Bohm et al.

Biosolids as by-products of wastewater treatment can contain a large spectrum of pathogens and antibiotic resistance genes (ARGs). Insect-based biocon...

www.sciencedirect.com

hermetia illucens

02/05/2024

Bioconversion of organic waste by insects – A comprehensive review - Siddiqui et al.

The ever-growing human population has forced people to intensify agriculture to meet the demand for food and feed. However, the increase in global agr...

www.sciencedirect.com

hermetia illucens tenebrio molitor

30/04/2024

Effect of Sample Presentation on the Classification of Black Soldier Fly Larvae Using Near-Infrared Spectroscopy - Sanchez et al.

Black soldier fly larvae (BSFL) (Hermetia illucens) reared on food waste streams are considered a sustainable source of protein in feed livestock diets. Recently, portable near-infrared spectroscopy (NIR) instruments have been assessed to monitor ...

www.mdpi.com

hermetia illucens

30/04/2024

Degradation of edible mushroom waste by Hermetia illucens L. and consequent adaptation of its gut microbiota - Lai et al.

The edible fungus industry is one of the pillar industries in the Yunnan–Guizhou Plateau, China. The expansion of the planting scale has led to the release of various mushroom residues, such as mushroom feet, and other wastes, which are not ...

www.nature.com

hermetia illucens

30/04/2024

Metabolic performance and feed efficiency of black soldier fly larvae - Eriksen

The black soldier fly (BSF), Hermetia illucens, is used in entomoremediation processes because its larvae can use a variety of organic residues with high efficiency. However, feed efficiencies are variable and characterized by uncertainties. ...

www.frontiersin.org

hermetia illucens

30/04/2024

Biodegradation of polystyrene nanoplastics by Achromobacter xylosoxidans M9 offers a mealworm gut-derived solution for plastic pollution - El-Kurdi et al.

Nanoplastics pose significant environmental problems due to their high mobility and increased toxicity. These particles can cause infertility and inflammation in aquatic organisms, disrupt microbial signaling and act as pollutants carrier. Despite ...

link.springer.com

tenebrio molitor

30/04/2024

Radical innovation breakthroughs of biodegradation of plastics by insects: history, present and future perspectives - Yang et al.

Insects damaging and penetrating plastic packaged materials has been reported since the 1950s. Radical innovation breakthroughs of plastic biodegradation have been initiated since the discovery of biodegradation of plastics by Tenebrio molitor ...

link.springer.com

hermetia illucens tenebrio molitor

29/04/2024

Assessing Substrate Utilization and Bioconversion Efficiency of Black Soldier Fly (Hermetia illucens) Larvae: Effect of Diet Composition on Growth and Development Temperature - Belperio et al.

Black soldier fly larvae (BSFL) can utilize food by-products or residues for growth, benefiting farm animal's diets' production sustainability. The experiment aimed to assess the effect of different substrate compositions on larval growth, chemical ...

www.mdpi.com

hermetia illucens

29/04/2024

Evaluating the Efficiency of Black Soldier Fly (Hermetia illucens) Larvae in Converting Mackerel Head Waste into Valuable Resources - Tirtawijaya et al.

The seafood processing industry generates significant waste, including mackerel heads (MH), constituting 20–32% of total waste. This study explored the potential of utilizing MH as a feed source for black soldier fly larvae (BSF larvae). BSF ...

www.mdpi.com

hermetia illucens

27/04/2024

Black soldier fly larvae mitigate greenhouse gas emissions from domestic biodegradable waste by recycling carbon and nitrogen and reconstructing microbial communities - Xiang et al.

Black soldier fly larvae have been proven to reduce greenhouse gas emissions in the treatment of organic waste. However, the microbial mechanisms involved have not been fully understood. The current study mainly examined the dynamic changes ...

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hermetia illucens

27/04/2024

Responses of physiological, microbiome and lipid metabolism to lignocellulose wastes in gut of yellow mealworm (Tenebrio molitor) - Mao et al.

There is limited research on physiological and degradation mechanisms of yellow mealworm, a novel organic waste converter, in processing lignocellulos...

www.sciencedirect.com

tenebrio molitor

22/04/2024

Use of irradiation against stored product insect species that infest edible insect rearing - Sileem et al.

Hermetia illucens (Linnaeus, 1758) and Tenebrio molitor (Linnaeus, 1758) larvae are considered the most important edible insects almost of the world. ...

www.sciencedirect.com

hermetia illucens tenebrio molitor

19/04/2024

Framework for valorizing waste- and by-products through insects and their microbiomes for food and feed - Muurmann et al.

Publication date: Available online 19 April 2024Source: Food Research InternationalAuthor(s): Asmus Toftkær Muurmann, Marija Banovic, M. Thomas P. Gilbert, Giovanni Sogari, Morten Tønsberg Limborg, Thomas Sicheritz-Pontén, Simon Bahrndorff

www.sciencedirect.com

18/04/2024

Evaluation of the decomposition ability and characteristics of pig manure treated with different larval instar stages of black soldier fly (Hermetia illucens L.) - Choi

Waste treatment using black soldier fly (BSF; Hermetia illucens L.) larvae is an emerging technology that reduces livestock manure disposal. This study aimed to evaluate the effect of different growt...

onlinelibrary.wiley.com

hermetia illucens

18/04/2024

Validation of Diets with Tomato Pomace in Complete Cycle Breeding of Tenebrio molitor (L.) (Coleoptera: Tenebrionidae) - Baldacchino et al.

By-product-based diets have the potential to improve the environmental and economic sustainability of Tenebrio molitor (Linnaeus, 1758) production. However, evaluations of the efficacy of new diets are generally focused on larval performance, while the effect on adults is poorly understood.

www.mdpi.com

tenebrio molitor

17/04/2024

Performance of feeding black soldier fly (Hermetia illucens) larvae on shrimp carcasses: A green technology for aquaculture waste management and circular economy - Hu et al.

Over 944 thousand tonnes of shrimp carcasses are produced worldwide during the shrimp production cycle, and black soldier fly larvae (BSFL) are a pote...

www.sciencedirect.com

hermetia illucens

17/04/2024

The juvenile hormone analogue, pyriproxifen, alters protein and fat composition of Tenebrio molitor larvae - Hill et al.

Abstract Maximising the yield of product from livestock is common practice in the agriculture industry and there is potential to extend this practice to the emerging insect industry, to produce high-quality, sustainable protein. Tenebrio molitor ...

brill.com

tenebrio molitor

12/04/2024

Exposure to entomopathogenic fungus and high larval density induce a strong immune response and life-history costs in black soldier fly, a commercially important insect - Opare et al.

This study investigated the effects of conspecific density and entomopathogenic fungi (EPF) exposure on the immune response and life-history traits of larvae of black soldier fly, Hermetia illucens (...

onlinelibrary.wiley.com

hermetia illucens

12/04/2024

How to reduce waste using black soldier fly larvae and produce a high-quality product - Ben-Mordechay et al.

Abstract With the growing human population the demand for protein is rising and waste production is increasing. Insects can provide a sustainable solution for both problems and produce food (protein and fat) from waste. Our study tested the ...

brill.com

hermetia illucens

12/04/2024

Canteen waste as food for black soldier fly larvae: risk of heavy metals accumulation? Variability during one year of rearing - Grosso et al.

Abstract Worldwide, about 244 million t/yr of waste are produced by canteens and restaurant, of which 4.7 million t/yr are generated at the Italian level. Canteen waste (CW) could be used for feeding larvae of insect to obtain new marketable ...

brill.com

hermetia illucens

11/04/2024

Reproductive output and other adult life-history traits of black soldier flies grown on different organic waste and by-products - Laursen et al.

The interest in mass-rearing black soldier fly (Hermetia illucens) larvae for food and feed is rapidly increasing. This is partly sparked by the abili...

www.sciencedirect.com

hermetia illucens

11/04/2024

Biodegradation of aged polyethylene (PE) and polystyrene (PS) microplastics by yellow mealworms (Tenebrio molitor larvae) - Wang et al.

Globally, over 287 million tons of plastic are disposed in landfills, rivers, and oceans or are burned every year. The results are devastating to our ...

www.sciencedirect.com

tenebrio molitor

09/04/2024

Biodegradation of various grades of polyethylene microplastics by Tenebrio molitor and Tenebrio obscurus larvae: Effects on their physiology - Ding et al.

Polyethylene (PE) is the most productive plastic product and includes three major polymers including high-density polyethylene (HDPE), linear low-dens...

www.sciencedirect.com

tenebrio molitor

09/04/2024

Effects of treatment process on larvae growth performance and nutrient yield during cyanobacteria bioconversion by black soldier fly - Gu et al.

Abstract Cyanobacteria blooms, a global environmental problem, have caused serious economic and ecological disasters worldwide. Black soldier fly larvae (BSFL) are known to feed and develop on a wide range of feed sources, which makes the use ...

brill.com

hermetia illucens

02/04/2024

Molecular-Weight-Dependent Degradation of Plastics: Deciphering Host–Microbiome Synergy Biodegradation of High-Purity Polypropylene Microplastics by Mealworms - He et al.

The biodegradation of polypropylene (PP), a highly persistent nonhydrolyzable polymer, by Tenebrio molitor has been confirmed using commercial PP microplastics (MPs) (Mn 26.59 and Mw 187.12 kDa). This confirmation was based on the reduction ...

pubs.acs.org

tenebrio molitor

Product - media

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

28/05/2024

Insect Protein as an Eco-Friendly Pet Food Solution Feeding Fido Sustainably

Insect-Based Pet Food Market to reach over USD 16.72 billion by the year 2031 - Exclusive Report by InsightAce Analytic "Insect-Based Pet Food Market" in terms of revenue was estimated to be worth $8.31 billion in 2023 and is poised to

www.openpr.com

hermetia illucens

27/05/2024

Portuguese companies introduce new petfood with insect protein

Portugese companies EntoGreen and petMaxi have teamed up to launch the innovative petfood, happyOne Premium Insect Protein, that contains 25% ...

www.feedandadditive.com

27/05/2024

Insect protein scale-up Goterra signs breakthrough offtake deal with fish feed group Skretting

The Australian arm of the world's largest fish feed business Skretting has entered a partnership with Canberra-based sustainability technology ...

www.businessnewsaustralia.com

hermetia illucens

27/05/2024

Aquafeed.com | Live insects in animal feed: What European regulation says

Recent European Union (EU) legislation has made significant strides in the use of live insects in animal feed.

www.aquafeed.com

22/05/2024

French insect protein group plans further overseas growth

'We are building an industry, not just a plant or a company,' Innovafeed CEO Clement Ray told IntraFish.

www.intrafish.com

07/05/2024

9 key considerations when raising insects for feed

Raising insects for use in poultry nutrition offers numerous opportunities, but there are important considerations that must be understood to ...

www.wattagnet.com

06/05/2024

Investing in Sustainability: Insect Feed Industry Predicted to Witness Rapid Growth

Insect Feed Market The total worth of the global insect feed market is experiencing robust growth, driven by increasing demand for nutrient-rich ...

marketresearchblog.org

tenebrio molitor hermetia illucens

05/05/2024

Alimentation animale : les insectes, une solution durable et innovante

L'avenir de l'alimentation animale se tourne vers une source protéique durable et respectueuse de l'environnement : les insectes. Des entreprises ...

www.wedemain.fr

05/05/2024

Eco India: A new buzzword for a protein rich animal feed: Insect farming - Scroll.in

Eco India: A new buzzword for a protein rich animal feed: Insect farming Scroll.in

scroll.in

02/05/2024

Innovafeed aims to advance sustainable insect protein production in North America

Innovafeed recently inaugurated an insect innovation center in Illinois, US, marking a milestone in its pursuit of global insect-based ingredient ...

www.feednavigator.com

hermetia illucens

26/04/2024

Maltento focused on insect innovation for pet and aqua feed - FeedNavigator.com

Maltento focused on insect innovation for pet and aqua feed FeedNavigator.com

www.feednavigator.com

hermetia illucens

25/04/2024

Insect meal as a tool for reducing the environmental impact of livestock production

Similar to livestock production, the top two impact hotspots in BSF production are energy and feed, indicating that using a clean energy mix, ...

www.feedandadditive.com

25/04/2024

Protix hails insect meal lifecycle assessment versus other proteins

Protix's insect meal, fats and meat slash carbon emissions by up to 89%, along with water and land use, compared to conventional proteins, study shows

www.undercurrentnews.com

19/04/2024

Feed & Food Show 2024 to shine light on insects as sustainable feed ingredients

Inhouse Farming – Feed & Food Show 2024, organised by the DLG (German Agricultural Society), will provide information on the agricultural ...

www.feedandadditive.com

tenebrio molitor hermetia illucens

08/04/2024

Insect Farm Hatches Plan for Greener Animal Feed for Chickens and Pigs

There’s been a lot of talk in the media over the last few years about insect protein, whether used in fake beef, protein bars, or other processed ...

www.goodnewsnetwork.org

hermetia illucens

04/04/2024

Making Aquaculture More Sustainable: Marubeni Farms Yellowtail on Insect-Based Feed

Amid rising costs and sustainability concerns surrounding fish meal, Marubeni has developed an insect-based feed that could prove to be a viable ...

api.follow.it

04/04/2024

Aquafeed.com | Skretting Chile adopts insect meal into its salmon aquafeeds

The company partnered with Cermaq to deliver aquafeeds with insect meal in 2023 and has also incorporated this ingredient in its new Coho diets ...

www.aquafeed.com

Product - articles

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

29/05/2024

Insect live larvae as a new nutritional model in duck: effects on gut health - Colombino et al.

Background This study aimed to evaluate the effects of Hermetia illucens (Black soldier fly-BSF) and Tenebrio molitor (Yellow mealworm-YMW) live larvae as a new nutritional model on duck's gut health, considering gut histomorphometry, mucin ...

animalmicrobiome.biomedcentral.com

hermetia illucens | tenebrio molitor

27/05/2024

Dietary black soldier fly oil enhances growth performance, flesh quality, and health status of largemouth bass (Micropterus salmoides) - Yuan et al.

The study aimed to assess the effects of dietary black soldier fly oil (BSFO) on the growth performance, flesh quality, and health status of largemout...

www.sciencedirect.com

hermetia illucens

27/05/2024

Nutritive value of feed substrate waste from black soldier fly larvae production, and its potential as an aquafeed ingredient - Thongprajukaew et al.

Abstract Black soldier fly larvae (BSFL, Hermetia illucens) are an alternative source of protein whereas little research has yet been conducted to investigate the potential application of feed substrate waste (FSW) from larval production in ...

brill.com

hermetia illucens

25/05/2024

The effect of fishmeal replacement with organic acid fermented black soldier fly (Hermetia illucens) larvae meal on growth, nutrient utilization, metabolic enzyme activity, antioxidant status ...

Black soldier fly (Hermetia illucens) larvae meal is emerging as an alternative protein source and good substitute of fishmeal (FM). In an 8-week feed...

www.sciencedirect.com

hermetia illucens

23/05/2024

Whole dried black soldier fly (Hermetia illucens) larvae are acceptable, palatable, and do not negatively affect health when fed to healthy, adult horses at low inclusion rates - Burron et al.

Black soldier fly larvae (BSFL) have the potential to be incorporated into equine feed as a sustainable and nutritionally dense insect-derived source ...

www.sciencedirect.com

hermetia illucens

23/05/2024

Defatted or hydrolyzed black soldier fly larvae have sufficient potential as an alternative to fishmeal for weaned pigs - Chang et al.

This study was conducted to investigate the effects of defatted and hydrolyzed forms of black soldier fly larvae (Hermetia illucens; BSFL) as fishmeal...

www.sciencedirect.com

hermetia illucens

23/05/2024

Dried crickets (Gryllus sigillatus) or black soldier fly (Hermetia illucens) larvae meal for broiler chickens: nutrient composition and digestibility - Fisher et al.

Abstract This study explores the potential of cricket meal and black soldier fly larvae meal (BSFLM) as alternative protein sources in broiler chicken diets. With the use of the substitution method, using diatomaceous earth as an external marker, ...

brill.com

hermetia illucens

21/05/2024

Multi-trait genetic parameter estimates in a Tenebrio molitor reference population: high potential for breeding gains - Sellem et al.

To address multiple issues impacting the climate imbalance, insects, and in particular Tenebrio molitor, represent now a promising alternative for pro...

www.sciencedirect.com

tenebrio molitor

20/05/2024

Excessive level of dietary insect protein negatively changed growth metabolomic and transcriptomic profiles of largemouth bass (Micropterus salmoides) - Sun et al.

Hermetia illucens (HI) meal is a promising substitute for fish meal (FM) in the feeds of farmed fish. However, the impacts of dietary HI meal on large...

www.sciencedirect.com

hermetia illucens

19/05/2024

Partial Replacement of Fishmeal with Black Soldier Fly Larvae Meal in Nile Tilapia Diets Improves Performance and Profitability in Earthen Pond - Kariuki et al.

Insect meals have the potential to be used as a source of nutrients in aquafeeds due to their high nutritional profile and cost effectiveness. The obj...

www.sciencedirect.com

hermetia illucens

15/05/2024

Protein requirements of large yellow croaker Larimichthys crocea depends on protein sources from the perspective of growth performance, digestive and absorptive enzyme activities, intestinal ...

The present study aimed to comparatively evaluate the protein requirements of large yellow croaker (initial body weight: 17.03 ± 0.11 g) fed with five...

www.sciencedirect.com

tenebrio molitor

14/05/2024

Physiological Response of European Sea Bass (Dicentrarchus labrax) Juveniles to an Acute Stress Challenge: The Impact of Partial and Total Dietary Fishmeal Replacement by an Insect Meal - Basto ...

This study aimed to explore the effect of FM substitution by defatted Tenebrio molitor larvae meal (dTM) on the response of European seabass to an acute stress challenge. An FM-based diet was used as a control and two other isoproteic/isoenergetic diets were formulated to replace 50 and 100% of FM by dTM.

www.mdpi.com

tenebrio molitor hermetia illucens

14/05/2024

Assessing the Socio-Economic Benefits and Costs of Insect Meal as a Fishmeal Substitute in Livestock and Aquaculture - Auzins et al.

Sustainability targets set by the United Nations, such as Zero Hunger by 2030, encourage the search for innovative solutions to enhance food production while preserving the environment. Alternative protein sources for feed, while conventional resources like soymeal and fishmeal become more expensive and scarcer, is one of the possibilities.

www.mdpi.com

tenebrio molitor | hermetia illucens

13/05/2024

Growth, Hepatic Enzymatic Activity, and Quality of European Seabass Fed on Hermetia illucens and Poultry By-Product Meal in a Commercial Farm - Pulido-Rodriguez et al.

Protein meals from insects in combination with poultry by-product meal appear to be promising ingredients for replacing conventional proteins in the diets of carnivorous fish. The present study explored the effects on growth performance, hepatic ...

www.mdpi.com

hermetia illucens

09/05/2024

Lauric acid content in intramuscular fat is a reliable indicator of black soldier fly larvae meal consumption in Muscovy ducks - Martinez Marin et al.

The present research investigated if intramuscular fatty acid (FA) profile could distinguish meat from ducks fed with black soldier fly larvae meal (BSFLM) during fattening. By using stepwise linear discriminant analysis on FA profiles of 96 ...

www.cell.com

hermetia illucens

04/05/2024

PSIV-A-11 Potential of black soldier fly (Hermetia illucens) larvae frass as a functional ingredient for nursery pigs - Rubio et al.

Abstract. Frass is the leftover material from the production of black soldier fly larvae (BSFL), which includes chitin-containing exoskeleton shedding, sma

academic.oup.com

hermetia illucens

01/05/2024

Defatted Tenebrio molitor meal time-dependently altered sensory quality and nutritional value of turbot Scophthalmus maximus during growing-out phase - Qi et al.

The yellow mealworm Tenebrio molitor (TM) is promising feed ingredient for aquafeed. However, consumers might reject insect-fed fish unless they know ...

www.sciencedirect.com

tenebrio molitor

01/05/2024

Apparent total tract digestibility of calcium and phosphorus from partially defatted Hermetia illucens larvae meal in pigs - Grundmann et al.

Abstract Insect meals, which have emerged as a sustainable protein source in animal nutrition, are also rich in calcium and phosphorus and thus might be a valuable source for supplying these minerals in farm animals. The aim of the present study ...

brill.com

hermetia illucens

30/04/2024

Defatted black soldier fly larvae meal in lactating sow and pre-weaning piglet diets: impacts on growth performance, fecal microbiota, and metabolic pathways - Zhao et al.

Abstract To address the underexplored use of black soldier fly larval (BSFL) meal in pig farming for sustainable development, this study examined the effects of substituting conventional protein with defatted BSFL meal in the pre-weaning diet ...

brill.com

hermetia illucens

27/04/2024

Live yellow mealworm (Tenebrio molitor) larvae: a promising nutritional enrichment for laying quails - Dalle Zotte et al.

The study aimed to evaluate the effect of supplementing live Tenebrio molitor (TM) larvae to laying quails (Coturnix japonica) as nutritional enrichme...

www.sciencedirect.com

tenebrio molitor

24/04/2024

Dietary Tenebrio molitor larvae meal effects on cellular stress responses, antioxidant status and intermediate metabolism of Oncorhynchus mykiss - Feidantsis et al.

The Journal of Animal Physiology and Animal Nutrition is an animal feed science and research journal covering the physiology and nutrition of farm and domestic animals.

onlinelibrary.wiley.com

tenebrio molitor

24/04/2024

Use of black soldier fly larvae and freshwater shrimp to partly substitute commercial diet for Nile tilapia cultured in smallholder fish farms – A case study in Busia County, Kenya - Kals et al.

Fish-farming in Kenya is challenged by the availability and high cost of feed ingredients, especially protein sources. Using black soldier fly larvae (Hermetia illucens) (BSFL) directly or indirectly as a feed ingredient to feed fish is interesting ...

www.frontiersin.org

hermetia illucens

24/04/2024

Robustness of business models for insect production for feed and food in Europe - Niyonsaba et al.

Abstract Insects and their derivatives are increasingly recognised as a (more) sustainable and circular protein source for feed and food. The European insect industry is growing, but upscaling remains a challenge due to multiple uncertainties. ...

brill.com

hermetia illucens tenebrio molitor

17/04/2024

Black soldier fly larvae meal in an extruded food: effects on nutritional quality and health parameters in healthy adult cats - Bosch et al.

Abstract We aimed to evaluate the effects of including black soldier fly larvae meal (BSFL) meal in a dry extruded food on nutritional quality and some health aspects in healthy adult cats. Two dry extruded foods with either poultry meal (control) ...

brill.com

hermetia illucens

12/04/2024

A Sustainable Diet for Tambaqui Farming in the Amazon: Growth Performance, Hematological Parameters, Whole-Body Composition and Fillet Color - de Matos Dantas et al.

The aim of this study was to produce feed based on locally sourced ingredients for tambaqui farming in Amazon. Diets were formulated with increasing levels (0, 25, 50, 75 and 100%) of defatted black soldier fly larvae meal (BSFL) as a replacement ...

www.mdpi.com

hermetia illucens

08/04/2024

Antibiotic Resistance in Enterococci and Enterobacteriaceae from Laboratory-Reared Fresh Mealworm Larvae (Tenebrio molitor L.) and Their Frass - Turchi et al.

The occurrence of antibiotic-resistant bacteria in foodstuff involves a human health risk. Edible insects are a precious resource; however, their consumption raises food safety issues. In this study, the occurrence of antibiotic resistant bacteria ...

www.mdpi.com

tenebrio molitor

07/04/2024

Utility of by-products of black soldier fly larvae (Hermetia illucens) production as feed ingredients for Pacific Whiteleg shrimp (Litopenaeus vannamei) - Fricke et al.

Projected growth in insect production as alternative feedstuffs will yield novel by-products that are potentially valuable for aquafeed applications. We analyzed the nutrient composition of three by-...

onlinelibrary.wiley.com

hermetia illucens

Industrials applications - media

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

29/05/2024

Insect frass becomes food for protein-rich microalgae

... for protein-rich food increases with population growth ... a sustainable raw material for food, feed, and other products ... introducing microalgae proteins into food and feed products. Current ... Citation: Insect frass becomes ...

food.einnews.com

tenebrio molitor

21/05/2024

Fine dining or a bush tucker trial? I tried eating insects — with surprising results

Cricket brisket, anyone?

metro.co.uk

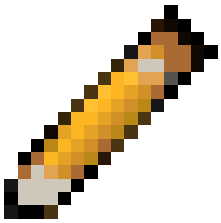
hermetia illucens

16/05/2024

Disgust still poses major barrier to adoption of insect protein

Despite a range of benefits, insect protein has faced strong barriers to adoption. This is largely due to consumer disgust, but some demographics ...

www.foodnavigator.com



13/05/2024

Insect Protein Industry to Showcase Continued Growth in the Coming Years

Insect protein refers to the protein derived from insects, which are increasingly recognized as a sustainable and nutritious source of protein ...

researchreportsinsight.blogspot.com

25/04/2024

Insect protein for companion animals: Hill's Pet Nutrition sees great potential

Leading US pet food manufacturer Hillâs Pet Nutrition highlights insects as a valuable, sustainable protein and fiber source for dogs.

www.feednavigator.com

hermetia illucens

25/04/2024

Why education is key to promoting insects as food and feed

Insect education creates a sense of empowerment and resilience among communities worldwide. As people gain the knowledge and skills to rear, ...

www.feedandadditive.com

Industrials applications - articles

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

27/05/2024

Insect flour as milk protein substitute in fermented dairy products - Neves et al.

Fermented dairy products (FDP) are consumed worldwide, due to their nutritional attributes and sensory properties. In the last decade, edible insects ...

www.sciencedirect.com

hermetia illucens | tenebrio molitor

27/05/2024

Development of a lexicon for the sensory description of edible insects commercially available in Australia - Bless et al.

Sensory lexicons provide an important tool for describing the sensory properties of emerging, unfamiliar foods such as edible insects. This study soug...

www.sciencedirect.com

tenebrio molitor

25/05/2024

Conversion of protein-rich waste into biodiesel by Hermetia illucens: Enhanced energy recovery and reduced greenhouse gas emissions - Elsayed et al.

The increased global demand for animal-based products results in generation of larger volume of protein-rich waste (PRW). Developing novel methods for...

www.sciencedirect.com

hermetia illucens

21/05/2024

Analysis of yellow mealworm (Tenebrio molitor) frass as a resource for a sustainable agriculture in the current context of insect farming industry growth - Zunzunegui et al.

With the ongoing rapid growth of the human population, the industrial development of mass insect rearing for feed and food is gaining momentum. This a...

www.sciencedirect.com

tenebrio molitor

17/05/2024

Determination of Triacylglycerol Composition in Mealworm Oil (Tenebrio molitor) via Electrospray Ionization Tandem Mass Spectrometry with Multiple Neutral Loss Scans - Lee et al.

Mealworms (Tenebrio molitor) have been used as an alternative source of proteins and lipids. Triacylglycerols (TAGs) are major sources of energy and have been used to provide essential fatty acids. They are also the main components of mealworm ...

www.mdpi.com

tenebrio molitor

16/05/2024

Antibacterial properties of oil extracts of black soldier fly larvae reared on bread waste - Shu et al.

Context Farming black soldier fly larvae (BSFL) has become an emerging agricultural sector for upcycling food waste into high-quality protein and oil biomass. Depending on the chemical composition of the food waste, the oil extracted from BSFL ...

www.publish.csiro.au

hermetia illucens

16/05/2024

Recombinant Chymotrypsin-like Peptidase from Tenebrio molitor with a Non-Canonical Substrate-Binding Site - Tereshchenkova et al.

Abstract We characterized an alkaline chymotrypsin-like serine peptidase from the yellow mealworm Tenebrio molitor with a non-canonical substrate-binding subsite for its possible application as a component (an additive) in various biological ...

link.springer.com

tenebrio molitor

16/05/2024

A novel family of defensin-like peptides from Hermetia illucens with antibacterial properties - Fahmy et al.

Background The world faces a major infectious disease challenge. Interest in the discovery, design, or development of antimicrobial peptides (AMPs) as an alternative approach for the treatment of bacterial infections has increased. Insects are ...

link.springer.com

hermetia illucens

15/05/2024

Detection of edible insect as a component of snack bars using histochemical method - Pečová et al.

The edible insects are commonly used in food products, but the methods for detection are not yet established. This study presents a new bright-field m...

www.sciencedirect.com

tenebrio molitor

14/05/2024

Impacts of black soldier fly, Hermetia illucens, larval frass on lettuce and arugula production - Chavez et al.

There are many benefits to producing insects for food and feed; they require fewer resources to produce, process, and distribute. The digested and undigested waste along with insect feces (i.e., frass) from the mass production of insects can ...

www.frontiersin.org

hermetia illucens

10/05/2024

Effect of Fiber and Insect Powder Addition on Selected Organoleptic and Nutritional Characteristics of Gluten-Free Bread - Tauferova et al.

A wide range of gluten-free bakery products are already available on the market. However, they often have a low proportion of fiber and inferior sensory properties when compared to classic baked goods. The aim of this work was to evaluate the ...

www.mdpi.com

10/05/2024

Hermetia illucens larvae fat vs coconut oil to obtain free lauric acid-rich products by chemical or enzymatic hydrolysis - Vázquez et al.

Abstract Lauric acid is present in various vegetable fats and has been shown to be beneficial for human health and well-being. The interest in the properties of this fatty acid has led to an increase in the production and consumption of oils ...

brill.com

hermetia illucens

09/05/2024

How the presence of residual lipids in a yellow mealworm protein concentrate affects its foaming properties? - Berthelot et al.

The use of whole and visible insects is poorly accepted in Western countries, and this remains a significant challenge for product development. Howeve...

www.sciencedirect.com

tenebrio molitor

08/05/2024

Innovative Applications of Tenebrio molitor Larvae in the Production of Sustainable Meat Sausages: Quality and Safety Aspects - Jankauskienė et al.

With the world’s population continuing to grow, ensuring sustainable protein sources for everyone is becoming increasingly challenging. Despite meat being considered unsustainable, people find it challenging to abstain from consuming it. However, ...

www.mdpi.com

tenebrio molitor

06/05/2024

Edible insects as a novel source of lecithin: Extraction and lipid characterization of black soldier fly larvae and yellow mealworm - Li et al.

Edible insects with high fat and phosphorus content are a potential novel source of lecithin, however, studies on their minor lipids are limited. In t...

www.sciencedirect.com

hermetia illucens

03/05/2024

In silico identification and expression analysis of superoxide dismutases in Tenebrio molitor- Jang et al.

Background Insects encounter various environmental stresses, in response to which they generate reactive oxygen species (ROS). Superoxide dismutase (SOD) is an antioxidant metalloenzyme that scavenges superoxide radicals to prevent oxidative ...

link.springer.com

tenebrio molitor

30/04/2024

Unveiling Environmental Influences on Sustainable Fertilizer Production through Insect Farming - Katchali et al.

Entomocomposting is fast and environmentally friendly, boosts soil quality and crop production, and improves resilience to climate change. The black soldier fly larvae (BSFL) catalyze the composting process, but their efficiency is highly influenced by environmental factors and the quality of the substrate.

www.mdpi.com

hermetia illucens

28/04/2024

Sourcing chitin from exoskeleton of Tenebrio molitor fed with polystyrene or plastic kitchen wrap - Ilijin et al.

In this work we have characterized and compared chitin sourced from exoskeleton of Tenebrio molitor larvae fed with polystyrene or plastic kitchen wra...

www.sciencedirect.com

tenebrio molitor

26/04/2024

The Potential of Black Soldier Fly Frass to Revitalise Marginal Soils - Mubekaphi et al.

Marginal soils have a reduced capacity for crop production due to physical and chemical limitations. These marginal soils, which are highly susceptible to degradation are dominant in sub-Saharan Africa (SSA). The high demand for agricultural ...

link.springer.com

hermetia illucens

21/04/2024

Isolation of Chitosan-Melanin Complex from Black Soldier Fly Adults and Obtaining Nanofibrous Materials Based on It - Khayrova et al.

Abstract The article presents the results of studying the viscosity of chitosan-melanin complex solutions from the insect Hermetia illucens and the process of gelation in these solutions in the presence of crosslinking reagents. Chemically c...

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hermetia illucens

20/04/2024

Larval Frass of Hermetia illucens as Organic Fertilizer: Composition and Beneficial Effects on Different Crops - Lomonaco et al.

Hermetia illucens has received a lot of attention as its larval stage can grow on organic substrates, even those that are decomposing. Black soldier fly breeding provides a variety of valuable products, including frass, a mixture of larval e...

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hermetia illucens

18/04/2024

Dried Porous Biomaterials from Mealworm Protein Gels: Proof of Concept and Impact of Drying Method on Structural Properties and Zinc Retention - Klost et al.

Dried porous materials can be found in a wide range of applications. So far, they are mostly prepared from inorganic or indigestible raw materials.

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tenebrio molitor

18/04/2024

Production, characterisation, and biological properties of Tenebrio molitor-derived oligopeptides - Gonzalez-de la Rosa et al.

Three protein hydrolysates from Tenebrio molitor were obtained by enzymatic hydrolysis employing two food-grade proteases (i.e. Alcalase and Flavourzy...

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tenebrio molitor

17/04/2024

Molecular Characterization of the Allergenic Arginine Kinase from the Edible Insect Hermetia illucens (Black Soldier Fly) - Delfino et al.

Molecular Nutrition & Food Research is a food science journal devoted to health, safety and molecular nutrition, including nutritional biochemistry, nutrigenomics, & more.

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hermetia illucens

16/04/2024

Valorization of Hermetia illucens breeding rejects by chitins and chitosans production. Influence of processes and life cycle on their physicochemical characteristics - Elkadaoui et al.

Breeding of the black soldier fly is carried out to produce proteins. It is accompanied by releases during the life cycle of this insect. This work is...

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hermetia illucens

13/04/2024

Gamma ray irradiation enhances defatted Hermetia illucens larvae meal as a dietary alternative to fishmeal for Acanthopagrus schlegelii juveniles - Ren et al.

The current research investigated whether gamma (γ)-irradiation could improve the viability of defatted Hermetia illucens larvae (HIL) meal as a fishm...

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hermetia illucens

11/04/2024

Microbial community dynamics during decomposition of insect exuviae and frass in soil - Nurfikari et al.

Publication date: Available online 10 April 2024Source: Soil Biology and BiochemistryAuthor(s): Azkia Nurfikari, Márcio Fernandes Alves Leite, Eiko Eurya Kuramae, Wietse de Boer

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tenebrio molitor hermetia illucens

03/04/2024

Computational modelling of extrusion process temperatures on the interactions between black soldier fly larvae protein and corn flour starch - Gamero-Barraza et al.

Insects such as the black soldier fly (BSF) are recently being studied as food sources to address concerns about how to meet the food demand of the gr...

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hermetia illucens

02/04/2024

Bioconversion approach for the valorization of Jatropha curcas seed cake into biodiesel using black soldier fly (Hermetia illucens) larvae - Wandji Nono et al.

The aim of this study was to assess the biodiesel potential of black soldier fly larvae (BSFL)-fed Jatropha curcas seed cake (JCSC). The larvae were fed with JCSC that had undergone three different treatments (biological, thermal, and thermo...

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