



Publications 2022

S.No	Authors	Document Title	Journal Title
1.	Materials Science in Semiconductor Processing	Evaluation of novel L-histidine-based Schiff base derivatives as microbial-HO inhibitors and their antimicrobial and molecular docking studies	Journal of Molecular Structure
2.	Rejula, M.J., Amudhini Stephen, S.E.	Weight minimization of a hollow shaft using non-traditional optimization	AIP Conference Proceedings
3.	Balakrishnan, P.D., Kanchana, P., Arunadevi, N., Rath, N.P., Premkumar, T.	New Guanidinium and Aminoguanidinim Salts of 2-Hydroxypyridine-3-carboxylic acid: Preparation and spectral, structural, thermal, ADMET, biological, and molecular docking studies	Journal of Molecular Structure
4.	Kamalakshan, K., Swamy, S.K.	The Paradox of Gender Performativity in Winnie-the-Pooh	Boyhood Studies
5.	Jebaseelan, V., Raju, K.K.	Protecting MANETs from Black and Gray Hole Attacks Through a Detailed Detection System	International Journal of Intelligent Engineering and Systems
6.	Suresh, S.N., Puspharaj, C., Subramani, R.	Development of Almond gum/alginate composites to enhance the shelf-life of post-harvest Solanum Lycopersicum L	Food Hydrocolloids for Health
7.	Shanjitha, S., Suvarnna, K., Zothanzama, J., Kumar, N.S., Premnath, D., Kirubavathy, S.J.	Crystallization of 1, 4-cyclohexanedicarboxylic acid bridged tetra nuclear Cu(II) complex containing N-N chelating ligand – crystal structure, antimicrobial, antioxidant, cytotoxicity and electrochemical studies	Journal of the Iranian Chemical Society
8.	Duraisamy, P.D., Paul, S.P.M., Gopalan, P., Paranthaman, S., Angamuthu, A.	A DFT Study of Halogen (F-, Cl-, and Br-) Encapsulated Ga ₁₂ X ₁₂ (X = N, P, and As) Nanocages for Sodium-Ion Batteries	Journal of Inorganic and Organometallic Polymers and Materials
9.	Sami, J.P., Jayashree, N.	Migration and Oil-Centric Life: A Study on Ghassan Kanafani's Men in the Sun	IAFOR Journal of Literature and Librarianship
10.	Pan, S., Gayathri, G., Reshma, T.S., Mangamma, G., Prasad, A.K., Das, A.	A sensitive humidity sensor at low pressure with SnO ₂ QDs	Sensors and Actuators A: Physical
11.	Thiruarul, D., Charles, J.W., Lavanya, M., Rajesh, K.B., Jaroszewicz, Z.	Generation of axially splitted ultra-long multiple optical needles/optical tubes using generalized cylindrical vector Bessel Gaussian beam phase modulated by annular Walsh function filter	Optical and Quantum Electronics
12.	Kanchana, P., Hemapriya, V., Arunadevi, N., Sundari, S.S., Chung, I.-M., Prabakaran, M.	Phytofabrication of silver nanoparticles from <i>Limonia acidissima</i> leaf extract and their antimicrobial, antioxidant and its anticancer prophecy	Journal of the Indian Chemical Society

13.	Poonguzhali, R.V., Srimathi, M., Kumar, E.R., Arunadevi, N., Elansary, H.O., Abdelbacki, A.A.A., Abdelmohsen, S.A.M.	Citrus limon assisted green synthesis of MgO nanoparticles: Evaluation of phase, functional groups, surface morphology, thermal stability and colloidal stability	Ceramics International
14.	Vandamar Poonguzhali, R., Ranjith Kumar, E., Arunadevi, N., Srinivas, C., Khalifa, M.E., Abu-Melha, S., El-Metwaly, N.M.	Natural citric acid assisted synthesis of CuO nanoparticles: Evaluation of structural, optical, morphological properties and colloidal stability for gas sensor applications	Ceramics International
15.	Vinodhini, K., Kavitha, S., Saranya, T., Geethalakshmi, K.	Molecular Analysis of bacteria isolated from the soil for its Potential Agnostic activity	Research Journal of Pharmacy and Technology
16.	Saranya, J., Anusuya, N., Benhiba, F., Warad, I., Zarrouk, A.	A Cyanopyran Derivative for Preventing Corrosion of Pipeline Material Used in The Oil and Gas Industry	Analytical and Bioanalytical Electrochemistry
17.	Adarshan, S., Akassh, S., Avinash, K., Bharathkumar, M., Muthuramalingam, P., Shin, H., Baskar, V., Chen, J.-T., Bhuvaneshwari, V., Ramesh, M.	Transcriptomics, Cheminformatics, and Systems Pharmacology Strategies Unveil the Potential Bioactives to Combat COVID-19	Molecules
18.	Arthi, G., Suganya, K., Nieto, J.J.	Controllability of nonlinear higher-order fractional damped stochastic systems involving multiple delays	Nonlinear Analysis: Modelling and Control
19.	Suresh, S.N., Puspharaj, C., Natarajan, A., Subramani, R.	Gum acacia/pectin/pullulan-based edible film for food packaging application to improve the shelf-life of ivy gourd	International Journal of Food Science and Technology
20.	Anusuya, N., Saranya, J., Benhiba, F., Warad, I., Zarrouk, A., Chitra, S.	Isoxazoline Derivatives as Inhibitors for Mild Steel Corrosion in 1M H ₂ SO ₄ : Computational and Experimental Investigations	Journal of Materials Engineering and Performance
21.	Sulaiman, M., Kiruthika, K., Harathi, P.B.	Range extension of lesser-known orchids to the Nilgiris of Tamil Nadu, India	Journal of Threatened Taxa
22.	Duraisamy, P.D., Prince Makarios Paul, S., Gopalan, P., Angamuthu, A.	Feasibility of halide (F ⁻ , Cl ⁻ and Br ⁻) encapsulated Be ₁₂ O ₁₂ nanocages as potential anode for metal-ion batteries – A DFT-D3 approach	Materials Science in Semiconductor Processing
23.	Venkatraman, D., Narayanan, R.	Integrated Framework for Intrusion Detection Through Adversarial Sampling and Enhanced Deep Correlated Hierarchical Network	Revue d'Intelligence Artificielle
24.	El Dib, G., Mano Priya, A., Lakshmi pathi, S.	Investigation of the Gas-Phase Reaction of Nopinone with OH Radicals: Experimental and Theoretical Study	Atmosphere
25.	Sundari, S.S., Arunadevi, N., Kanchana, P., Meena, P., Kumar, E.R., Elansary, H.O., Mahmoud, E.A., Abdelmohsen, S.A.M.	Influence of carboxylic acids on structural, optical, thermal, and electrical properties of ferroelectric glycine phosphite single crystals	Journal of Materials Science: Materials in Electronics
26.	Priyanka, D., Nalini, D.	Designing a corrosion resistance system using modified graphene oxide-epoxy microcapsules for	Applied Surface Science Advances

		enhancing the adhesion strength of the epoxy coatings	
27.	Ross, N.S., Srinivasan, N., Amutha, P., Gupta, M.K., Korkmaz, M.E.	Thermo-physical, tribological and machining characteristics of Hastelloy C276 under sustainable cooling/lubrication conditions	Journal of Manufacturing Processes
28.	P S, A., Vinod, V., Harathi, P.B.	A critical review on extraction and analytical methods of phthalates in water and beverages	Journal of Chromatography A
29.	Kirubavathy, S.J., Arunadevi, N., Pavithra, P., Pavithra, P.S., Pavithra, D., Pavithra, M.	Magnetite Fe ₃ O ₄ Nano-oxide from Aqueous leaf Extract of <i>Coccinia grandis</i> (L.) Voigt: Synthesis, Characterization, Magnetic studies and Anti-cancer Evaluation	Indian Journal of Pharmaceutical Education and Research
30.	Gokilavani, R., Rehana Banu, H.	GC-MS analysis of endolichenic fungus isolated from <i>Hypotrachyna infirma</i> (Kurok.) Hale	Research Journal of Biotechnology
31.	Duraisamy, P., Gopalan, P., Angamuthu, A.	Investigation of N-H···H-M Dihydrogen Bonded Interactions in Adenine, Cytosine, Guanine, and Thymine with H-M (M = Li and Na) Complexes: A DFT Study	Russian Journal of Physical Chemistry A
32.	Nagarathinam, S., Narayanan, R.	Deep Positional Attention-Based Hierarchical Bidirectional RNN with CNNBased Video Descriptors for Human Action Recognition	International Journal of Intelligent Engineering and Systems
33.	Swathika, M., Singh, K.R., Mehal, M., Pandey, S., Singh, J., Singh, R.P., Natarajan, A.	Design and synergistic effect of nano-sized epoxy-NiCo ₂ O ₄ nanocomposites for anticorrosion applications	RSC Advances
34.	Sankaran, S.S., Dhanasekaran, R., Kumar, B., Durairajan, A., Valente, M.A., Devaraj Stephen, L.	Study on growth, optical and dielectric properties of 'Nd' DOPED NBT-BT (0.94(Na _{0.5} Bi _{0.5} Tio ₃)-0.06BaTiO ₃) relaxor ferroelectric single crystals	Journal of Electroceramics
35.	Midhun Dominic, C.D., Raj, V., Neenu, K.V., Begum, P.M.S., Formela, K., Saeb, M.R., Prabhu, D.D., Poornima Vijayan, P., Ajithkumar, T.G., Parameswaranpillai, J.	Chlorine-free extraction and structural characterization of cellulose nanofibers from waste husk of millet (<i>Pennisetum glaucum</i>)	International Journal of Biological Macromolecules
36.	Senthilkumar, M., Udhayakumar, M., Lavanya, M., Mahadevan, G., Rajesh, K.B., Jaroszewicz, Z.	Generation of 1D array of focal segments using spirally polarized beam and Complex Phase Filter	Optics and Laser Technology
37.	Senthilkumar, P., Chandran, S., Kartsev, A., Shavrov, V., Lega, P., Subramani, R.	Preparation and Chemical/Physical Characterization of Individual Na-noscaled Fibrils	Nanoscience and Nanotechnology - Asia
38.	Parimala devi, D., Praveena, G., Jeba Beula, R., Abiram, A.	INVESTIGATION OF DIHYDROGEN BOND INTERACTION BETWEEN CYCLOALKENES AND ALKALI METAL HYDRIDES: A DFT APPROACH	Journal of Structural Chemistry
39.	Sasikala, T., Shanmugasundaram, K., Thirunavukkarasu, P., Nithya, N., Vivek, P.	The influence of Zn on MoS ₂ thin films by jet nebulizer spray coating method for P-N diode application	Journal of Materials Science: Materials in Electronics

40.	Suvarnna, K., Kirubavathy, S.J., Selvasekarapandian, S., Krishna, M.V., Ramaswamy, M.	Corn silk extract-based solid-state biopolymer electrolyte and its application to electrochemical storage devices	Ionics
41.	Sasikumar, A.P., Ramaswamy, S.K., Sudhir, S.	A scientific pharmacognosy on Gaucher's disease: an in silico analysis	Environmental Science and Pollution Research
42.	Sudha, V.P., Vijaya, M.S.	Recurrrent Neural Network Based Model for Autism Spectrum Disorder Prediction using Codon Encoding	Journal of The Institution of Engineers (India): Series B
43.	Deebasree, J.P., Maheskumar, V., Vidhya, B.	Investigation on the impact of pH on the photocatalytic activity of sonochemically synthesised BIVO ₄	Materials Letters
44.	Arthi, G., Brindha, N., Baleanu, D.	Finite-time stability results for fractional damped dynamical systems with time delays	Nonlinear Analysis: Modelling and Control
45.	Jayachandran, P., Angamuthu, A., Gopalan, P.	Redox potentials of puckered 1,4-benzoquinone	Journal of Chemical Sciences
46.	Makarios Paul, S.P., Parimala devi, D., Praveena, G., Beula, R.J., Haris, M., Abiram, A.	Theoretical investigation on the interaction between Metformin and Ferulic acid - A DFT approach	Journal of the Indian Chemical Society
47.	Sivanandhan, M., Parasuraman, A., Surya, C., Lakshminarayanan, K., Krishnakumar, B., Mani, D., Ahn, Y.-H.	Facile approach for green synthesis of fluorescent carbon dots from Manihot esculenta and their potential applications as sensor and bio-imaging agents	Inorganic Chemistry Communications
48.	Jincy, C.S., Meena, P.	Evaluation of cytotoxic activity of Fe doped cobalt oxide nanoparticles	Journal of Trace Elements in Medicine and Biology
49.	Kavita, S., Alagusoundarya, M., Ramakrishna, V.V., Suresh, V., Bhatt, P., Srimathi, P., Archana, R., Kar, D., Thomas, T., Gopalan, R.	On the table-like magnetocaloric effect, microstructure and mechanical properties of LaxFe11.6 Si1.4 system	Journal of Alloys and Compounds
50.	Kanthalraj, V., Ramasamy, N.K., Yoon, Y.-E., Cheong, M.S., Kim, Y.-N., Lee, K.-A., Kumar, V., Choe, H., Kim, S.Y., Chohra, H., Lee, Y.B.	Auxin-Glucose Conjugation Protects the Rice (<i>Oryza sativa L.</i>) Seedlings Against Hydroxyurea-Induced Phytotoxicity by Activating UDP-Glucosyltransferase Enzyme	Frontiers in Plant Science
51.	Arunadevi, N.	Metal nanocomposites for advanced futuristic biosensing applications	Materials Letters
52.	Arunadevi, N., Swathika, M., Mehala, M., Ranjith Kumar, E., Bawazeer, T.M., Morad, M., Alkhamis, K., Al-nami, S.Y., El-Metwaly, N.M.	New epoxy-Nano metal oxide-based coatings for enhanced corrosion protection	Journal of Molecular Structure
53.	Preethi, G., Andal, N.M.	Organophosphorus Pesticide Chelation by	Indian Journal of

		Modified Pod Shells - Batch Equilibration and Isothermal Studies	Environmental Protection
54.	Lega, P.V., Kartsev, A.I., Shuhui, L., Subramani, R., Koledov, V.V.	Thermoelastic Martensitic Transformation and Shape Memory Effect in Nanoplates Based on Ti-Ni Alloys: Experiment, Modeling by Density Functional Theory and Molecular Dynamics	Journal of Surface Investigation
55.	Pandaram, M., Santhanakumar, S., Veeran, R., Balasundaram, R.K., Jha, R., Jaroszewicz, Z.	Platinum Layers Sandwiched Between Black Phosphorous and Graphene for Enhanced SPR Sensor Performance	Plasmonics
56.	Vedachalam, S., Sekar, P., Nithya, C., Murugesh, N., Karvembu, R.	Dopant-Free Main Group Elements Supported Covalent Organic-Inorganic Hybrid Conducting Polymer for Sodium-Ion Battery Application	ACS Applied Energy Materials
57.	Bhuvaneshwari, V., Ramasamy, N.K., Kumar, S.I., Kalaivani, S., Vaidehi, D., Kumar, D.K.	Antimicrobial activity of copper nanomaterials: Current status and future perspectives	Copper Nanostructures: Next-Generation of Agrochemicals for Sustainable Agroecosystems
58.	Dave, S., Jone Kirubavathy, S.	Biosensors based on metal-organic framework (MOF): Paving the way to point-of-care diagnosis	Electrochemical Applications of Metal-Organic Frameworks: Advances and Future Potential
59.	Umamageswari, N., Thiruarul, D., Lavanya, M., Charles, J.W., Jaroszewicz, Rajesh, K.B.	Engineering axially polarized sub-wavelength scale focal structures using annular Walsh filter	Journal of Optics (India)
60.	Sabui, P., Mallick, S., Singh, K.R.B., Natarajan, A., Verma, R., Singh, J., Singh, R.P.	Potentialities of fluorescent carbon nanomaterials as sensor for food analysis	Luminescence
61.	Sowmiya, D., Surya Kumar, S., Rehanabu, H., Santhana Bharathi, N., Sowmiya, D., Surya Kumar, S., Rehanabu, H., Santhanabharathi, N.	Insecticidal potential of certain common ferns on Rugose spiralling whitefly, <i>Aleurodicus rugioperculatus</i> Martin (Hemiptera: Aleyrodidae)	Journal of Biopesticides
62.	Kiruthika, R., Vijaya, M.S.	Studying the Effectiveness of Community Detection Algorithms Using Social Networks	Cognitive Science and Technology
63.	Sasikala, D., Deepa, M.	A New Perspective of Neutrosophic Hyperconnected Spaces	Neutrosophic Sets and Systems
64.	Sudha, D., Kumar, E.R., Shanjitha, S., Munshi, A.M., Al-Hazmi, G.A.A., El-Metwaly, N.M., Kirubavathy, S.J.	Structural, optical, morphological and electrochemical properties of ZnO and graphene oxide blended ZnO nanocomposites	Ceramics International
65.	Kanchana, P., Aruna Devi, N., Prabha Devi, B., Shanmuga Sundari, S., Hemapriya, V., Chung, I.-	New transition metal(II) complexes with naphthoate and aminoguanidine-based ligands: a combined spectroscopic and theoretical study with its applications	Journal of Coordination Chemistry

	M., Prabakaran, M.		
66.	Nair, J.P., Vijaya, M.S.	River Water Quality Prediction and index classification using Machine Learning	Journal of Physics: Conference Series
67.	Chhabria, S., Raghavendra Rao, A.V., Naga Lakshmi, V., Patil, P.P., Anandaram, H., Bhattacharya, S., Francisca Kalavathi, D., Dhivya, A., Neway Jida, S.	Valorization of Hazardous Materials along with Biomass for Green Energy Generation and Environmental Sustainability through Pyrolysis	Journal of Chemistry
68.	Swathika, M., Natarajan, A.	Synthesis and photometric properties of efficient white-emitting phosphor of M-AMG transition metal complexes for OLED applications	Luminescence
69.	Midhun Dominic, C.D., Maheswary, S., Neenu, K.V., Sajadi, S.M., dos Santos Rosa, D., Sabura Begum, P.M., Mathew, M., Ajithkumar, T.G., Parameswaranpillai, J., George, T.S., Resmi, V.C., Ilyas, R.A., Badawi, M.	C olocasia esculenta stems for the isolation of cellulose nanofibers: a chlorine-free method for the biomass conversion	Biomass Conversion and Biorefinery
70.	Prakash, T., Priyanka, R., Siranjeevi, R., Kumar, E.R., Arunadevi, N., Alharthi, S.S.	Evaluation of microstructural, optical, vibrational properties and photocatalytic activity of CdO nanostructure	Ceramics International
71.	Priyanka, D., Vinuchakravarthi, S., Nalini, D., Quraishi, M.A., Chauhan, D.S.	Graphene oxide integrated into protective coatings against corrosion for metals and its alloys: A review	International Journal of Corrosion and Scale Inhibition
72.	Mercy, J.R., Stephen, S.E.A., Edna, K.R.J.	Design optimization of a hollow shaft through MATLAB and simulation using ANSYS	Coupled Systems Mechanics
73.	Kalaivani, A., Karpagavalli, S.	Deep Neural Network Optimization for Skin Disease Classification Forecast Analysis	8th International Conference on Advanced Computing and Communication Systems, ICACCS 2022
74.	Kowsalya, R., Roseline Jeetha, B.	Cluster based data-aggregation using lightweight cryptographic algortihm for wireless sensor networks	Materials Today: Proceedings
75.	Sathy Priyadarshini, G., Subramani, R., Elakkiya, S., Gopal, S.	Synthesis of novel luminescent cyclometallated platinum (IV) complexes with a quinoline Schiff bases ligand and their photophysical properties	Inorganic and Nano-Metal Chemistry
76.	Salma, S., Aariba, S., Velvizhi, M., Yasmin, N., Sudha, U.V., Anitha, M.C., Naveena Reddy, S.	Qualitative phytochemical analysis of eight turmeric (<i>Curcuma longa L</i>) cultivars grown in various geographical locations of India with six extracts – A comparative study	Materials Today: Proceedings
77.	Arunadevi, N., Kanchana, P., Hemapriya, V., Mehala, M., Swathika, M., Chung, I.-M., Prabakaran, M.	A two-step strategy to synthesis new aminoguanidinium complexes: cytotoxic effect and perspectives	Inorganic and Nano-Metal Chemistry
78.	Praveetha, S., Arunadevi, N..	Encapsulation of inulin loaded ovalbumin	ECS Transactions

	Shavrov, V., Lega, P., Subramani, R.	nanofibrils in toned milk to enhance the nutritional value	
79.	Swathika, M., Arunadevi, N.	Recent Advances in Hydrogen Evolution Reaction Using First-Row Transition Metal Complexes as Catalyst	ECS Transactions
80.	Karthika, S., Andal, N.M.	An Influence of Wastewater Discharges from Paper Mills on Farm Practices	ECS Transactions
81.	Sangeetha, M., Kousalya, R.	An Optimized Weighted Consensus Clustering with Removal of Less Informative Composite Clusters	Proceedings of the 2022 9th International Conference on Computing for Sustainable Global Development, INDIACom 2022
82.	Geethalakshmi, K., Meenakshi, V.S.	Diabetic Retinopathy Lesions Identification in the Color Fundus Images using Multi-Layer Perceptron	Proceedings of the 2022 9th International Conference on Computing for Sustainable Global Development, INDIACom 2022
83.	Sasikala, D., Divya, A., Jafari, S.	THE ROLE OF INTERIOR AND CLOSURE OPERATOR IN MEDICAL APPLICATIONS	Turkish World Mathematical Society Journal of Applied and Engineering Mathematics
84.	Kalaivani, A., Karpagavalli, S.	A Deep Ensemble Model for Automated Multiclass Classification Using Dermoscopy Images	Proceedings - 6th International Conference on Computing Methodologies and Communication, ICCMC 2022
85.	Singh, K.R.B., Natarajan, A.	Molecularly imprinted polymer-based optical immunosensors	Luminescence
86.	Maxwalt, S., Rahupathy, K., Suresh, S.N., Subramani, R., Pushparaj, C.	Synthesis of eco-friendly nanocomposite with silver nanoparticle to increase the antimicrobial activity	Materials Today: Proceedings
87.	Muthusamy, L., Rajendran, M., Ramamoorthy, K., Narayanan, M., Kandasamy, S.	Phytostabilization of metal mine tailings-a green remediation technology	Phytoremediation Technology for the Removal of Heavy Metals and Other Contaminants from Soil and Water
88.	Veerapandi, L., Nivetha, T., Sinthiya, R., Amirthadharshini, N.K., Bumaasri, K., Aishwarya, R.	Insilico and Pharmacological Property Analysis of Bioactive Components from <i>Prunus avium</i> against Diabetics	Journal of Natural Remedies
89.	Ponnambalam, P., Kamalakkannan, J.,	Novel synthesis of Cu-ZnO heterostructure for photoelectric, medicinal, and sun-light dye	Inorganic and Nano-Metal Chemistry

	Jayaseelan, R., Selvi, G.	degradative applications	
90.	Senthilkumar, P., Shavrov, V., Lega, P., Subramani, R.	Resveratrol-loaded β -Lactoglobulin Nanofibrils to Prevent Enzymatic Browning on Sliced Apple	Applied Food Biotechnology
91.	Santhana Lakshmi, V., Vijaya, M.S.	A Study on Machine Learning-Based Approaches for PM2.5 Prediction	Lecture Notes on Data Engineering and Communications Technologies
92.	Ponnambalam, P., Kamalakkannan, J., Jayaseelan, R., Doss, M.A., Selvi, G.	Synthesis, Characterization, Photocatalytic and Photovoltaic Applications of a Novel Semiconductor CuPbO Nanomaterial	Asian Journal of Chemistry
93.	Prakash, P., Archana, G., Gayathiri, E., Mani, V., Manivasagaperumal, R., Vinoth, B., Peele, K.A., Selvam, K., Thirupathi, A., Alodaini, H.A., Al-Dosary, M.A., Hatamleh, A.A., Chang, S.W., Ravindran, B.	Pharmakinetics studies, molecular docking and discovery of anti- proliferative agents and its targeting EGFR inhibitors	Journal of King Saud University - Science
94.	Deepika, A., Radha, N.	Performance Analysis of Abstract-Based Classification of Medical Journals Using Machine Learning Techniques	Lecture Notes on Data Engineering and Communications Technologies
95.	Arunadevi, N., Kanchana, P., Hemapriya, V., Sankaran, S.S., Mayilsamy, M., Balakrishnan, P.D., Chung, I.-M., Mayakrishnan, P.	Synthesis and crystal growth of cadmium naphthoate crystal for second order non-linear optics and cytotoxic activity	Journal of Dispersion Science and Technology
96.	Narayanan, M., Murugan, J.M., Kandasamy, G., Kandasamy, S., Nasif, O., Rajendran, M., Pugazhendhi, A.	The biotransformation potential of <i>Bacillus cereus</i> on β - cypermethrin to protect the earthworm (<i>Perionyx excavatus</i>) on insecticide -contaminated soil	Archives of Agronomy and Soil Science