



BIBLIOGRAPHY

BIBLIOGRAPHY

- Abbott WS (1925) A method of computing the effectiveness of an insecticide. *J Econ Entomol.* 18(2):265-267.
- Ahmad I, Hamid T, Fatima M, Chand HS, Jain SK, Athar M, Raisuddin S (2000) Induction of hepatic antioxidants in freshwater catfish (*Channa punctatus* Bloch) is a biomarker of paper mill effluent exposure. *Biochim Biophys Acta.* 1523(1):37-48.
- Akinci M, Kosova F, Cetin B, Sepici A, Altan N, Aslan S, Cetin A (2008) Oxidant/antioxidant balance in patients with thyroid cancer. *Acta Cir Bras.* 23(6):551-554.
- al-Saleh IA (1994) Pesticides: a review article. *J Environ Pathol Toxicol Oncol.* 13(3):151-161.
- Alsharif NZ, Grandjean CJ, Murray WJ, Stohs SJ (1990) 2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin (TCDD)-induced decrease in the fluidity of rat liver membranes. *Xenobiotica.* 20(9):979-988.
- Ander K (1939) In: Comparative anatomical and phylogenetic studies on the Ensifera (Saltatoria). *Opusc Entomol Suppl II Lund.* pp 306.
- Andersen AN, Ludwig JA, Lowe LM, Rentz D (2001) Grasshopper biodiversity and bio-indicator in Australian tropical savannas: Responses to disturbance in Kakadu National Park. *Austral Ecol.* 26(3):213-222.
- Ascher KRS, Gseil R (1981) The effect of neem seed kernel extract on *Epilachna varivestis* Muis. larvae. *Z. Pflanzbau. Pflanzenschutz* 88:764-767.
- Attri BS, Ravi Prasad C (1980) Neem oil extractive-an effective mosquito larvicide. *Indian J Entomol.* 42:371-374.
- Azambuja P, Garcia ES (1992) Effects of azadirachtin on *Rhodnius prolixus*: immunity and Trypanosoma interaction. *Mem Inst Oswaldo Cruz.* 87(Suppl.5):69-72.

- Ballesteros ML, Wunderlin DA, Bistoni MA (2009) Oxidative stress responses in different organs of *Jenynsia multidentata* exposed to endosulfan. Ecotoxicol Environ Saf. 72(1):199-205.
- Barnby MA, Kocke JA (1987) Effect of azadirachtin on the nutrition and development of the tobacco bud worm, *Heliothis virescens* (Fabr.) (Noctuidae). J Insect Physiol. 33(2):69-75.
- Batra AK, Keoliya AN, Jadhav GU (2003) Poisoning: an unnatural cause of morbidity and mortality in rural India. J Assoc Physicians India. 51:955-959.
- Beauchamp C, Fridovich I (1971) Superoxide dismutase: improved assays and an assay applicable to acrylamide gels. Anal Biochem. 44(1):276-287.
- Bebe FN, Panemangalore M (2003) Exposure to low doses of endosulfan and chlorpyrifos modifies endogenous antioxidants in tissues of rats. J Environ Sci Health B. 38(3):349-363.
- Bei-Bienko Gya (1958) Principle of change of stations and the problem of initial divergence of species.-XVth Int Sci Cong Zool. Sect: II. 31:1-3.
- Belfield A, Goldberg DM (1971) Colorimetric determination of alkaline phosphatase activity. Enzyme. 12(5):561-568.
- Bezzar-Bendjazia R, Kilani-Morakchi S, Maroua F, Aribi N (2017) Azadirachtin induced larval avoidance and antifeeding by disruption of food intake and digestive enzymes in *Drosophila melanogaster* (Diptera: Drosophilidae). Pestic Biochem Physiol. 143:135-140.
- Bieringer G, Zulka KP (2003) Shading out species richness: edge effect of a pine plantation on the Orthoptera (Tettigonoidea and Acrididae) assemblage of an adjacent dry grassland. Biodivers Conserv. 12(7):1481-1495.

- Bilton JN, Broughton HB, Jones PS, Ley SV, Lidert Z, Morgan ED, Rzepa HS, Sheppard RN, Slawin AMZ, Williams DJ (1987) An X-ray crystallographic, mass spectroscopic and NMR study of the; liomnoid insect antifeedant azadirachtin and relatives derivatives. *Tetrahedron*. 43:2805-2815.
- Biswas K, Chattopadhyay I, Banerjee RK, Bandyopadhyay U (2002) Biological activities and medicinal properties of neem (*Azadirachta indica*). *Curr Sci*. 82(11):1336-1345.
- Blaney WM, Simmonds MSJ, Ley SV, Anderson JC, Too good PL (1990) Antifeedant effects of azadirachtin and structurally related compounds on lepidopterous larvae. *Entomol Exp et Appl*. 55(2):149-160.
- Bomford MK, Isman MB (1996) Desensitization of fifth instar *Spodoptera litura* to azadirachtin and neem. *Entomol Exp Appl*. 81(3):307-313.
- Branson DH, Sword GA (2010) An experimental Analysis of grasshopper community responses to fire and livestock grazing in a Northern Mixed-Grass Prairie. *Environ Entomol*. 39(5):1441-1446.
- Broadway RM, Duffey SS (1986) The effect of dietary protein on the growth and digestive physiology of larval *Heliothis zea* and *Sodoptera exigua*. *J Insect Physiol*. 32(8):673-680.
- Bromham L (2009) Why do species vary in their rate of molecular evolution? *Biol Lett*. 5(3):401-404.
- Butnariu M, Samfira I (2012) Free radicals and oxidative stress. *J Bioequiv Availab*. 4(3):iv-vi.
- Butterworth JH, Morgan ED (1968) Isolation of a substance that suppresses feeding in locust. *Chem Comm*. 35(1):23-24.

- Butterworth JH, Morgan ED (1971) Investigation on the locust feeding inhibition of the seeds of the neem tree, *Azadirachta indica*. *J Insect Physiol.* 17(6):969-977.
- Caboni P, Cabras M, Angioni A, Russo M, Cabras P (2002) Persistence of azadirachtin residues on olives after field treatment. *J Agric Food Chem.* 50(12):3491-3494.
- Casado MF, Cecchini AL, Simão ANC, Oliveira RD, Cecchini R (2007) Free radical-mediated pre-hemolytic injury in human red blood cells subjected to lead acetate as evaluated by chemiluminescence. *Food Chem Toxicol.* 45(6):945-952.
- Catalgol BK, Ozden S, Alpertunga B (2007) Effects of trichlorfon on malondialdehyde and antioxidant system in human erythrocytes. *Toxicol In Vitro.* 21(8):1538-1544.
- Chapman RF (1985) Structure of the digestive systems. In: Kerkut GA, Gilbert LI (eds) *Comprehensive insect physiology, biochemistry and pharmacology.* vol 4, Per-gamon Press, Oxford, UK. pp 165-211.
- Cherrill A (2010) Species richness of orthoptera along gradients of agricultural intensification and urbanization. *J Orthoptera Res.* 19(2):293-301.
- Compton MM (1992) A biochemical hallmark of apoptosis: internucleosomal degradation of the genome. *Cancer Metastasis Rev.* 11(2):105-119.
- Condor-Golec AF (2007) Effect of neem (*Azadirachta indica* A. Juss) insecticides on parasitoids. *Revista Peruana de Biología.* 14(1):69-74.
- Cui Z-G, Jin Y-J, Sun L, Zakki SA, Li M-L, Feng Q-W, Kondo T, Ogawa R, Inadera H (2018) Potential hazards of fenvvalerate in massive pollution influence the apoptosis sensitivity. *J Appl Toxicol.* 38(2):240-247.
- Cynshi O, Tamura K, Niki E (2010) Design, synthesis, and action of antiatherogenic anti-oxidants. *Methods Mol Biol.* 610:91-107.
- Das U (2002) A radical approach to cancer. *Med Sci Monit.* 8(4):79-92.

- Davis BJ (1964) Disc electrophoresis. II. Method and application to human serum proteins. Ann N Y Acad Sci. 121:404-427.
- Denamur E, Matic I (2006) Evolution of mutation rates in bacteria. Mol Microbiol. 60(4):820-827.
- Devkota B, Schmidt GH (2000) Accumulation of heavy metals in food plants and grasshoppers from the Taigetos Mountains, Greece. Agril Ecosyst Environ. 78(1):85-91.
- Dhar R, Dawar H, Garg S, Basir SE, Talwar GP (1996) Effect of volatiles from neem and other natural products on gonotrophic cycle and oviposition of *Anopheles stephensi* and *An. culicifacies* (Diptera: Culicidae). J Med Entomol. 33(2):195-201.
- Dimetry N, Schmidt GH (1992) Efficacy of Neem-Azal-S and Margozan-O against the bean aphid, *Aphis fabae*. Anz Schädlingskd Pflanzjahres Umweltschutz. 65:75-79.
- Dirsh VM (1961) A preliminary revision of the families and sub-families of Acridoidea (Orthoptera: Insecta). Bull Br Mus nat Hist (Ent), London, 10:349-419.
- Dorn A, Rademacher JM, Sehn E (1986) Effect of azadirachtin on the moulting cycle, endocrine system and ovaries in last-instar larvae of the milk weed bug, *Oncopeltus fasciatus*. J Insect Physiol. 32(3):231-238.
- Dorn A, Rademacher JM, Sehn E (1987) Effects of azadirachtin on reproductive organs and fertility in the large milkweed bug, *Oncopeltus fasciatus*. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem tree (*Azadirachta indica*) and other tropical plants. Proc 3rd Int Neem Conf. Nairobi, GTZ, Eschborn, Germany. pp 273-288.
- Doss PJ, Sreelatha P, Sulthana RN, Lakshmi Bai VK (2008) Effect of cypermethrin on selective biochemical parameters in a fish *Heteropneustes fossilis*. Aquaculture. 9:205-210.
- Drum C (1980) Soil chemistry of pesticides, PPG Industries, Inc. USA.

- Dutta HM, Arends DA (2003) Effects of endosulfan on brain acetylcholinesterase activity in juvenile bluegill sunfish. Environ Res. 91(3):157-162.
- Dzamalala CP, Milner DA, Liomba NG (2005) Suicide in Blantyre, Malawi (2000-2003). J Clinic Forensic Med. 13(2):65-69.
- Eddleston M (2000) Patterns and problems of deliberate self-poisoning in the developing world. Q J Med. 93(11):715-731.
- Eddleston M, Singh S, Buckley N (2003) Acute organophosphorus poisoning. Clin Evid. 10:1652-1663.
- El-Demerdash FM (2007) Lambda-cyhalothrin-induced changes in oxidative stress biomarkers in rabbit erythrocytes and alleviation effect of some antioxidants. Toxicol In Vitro. 21(3):392-397.
- Eldridge BF (2008) Pesticide application and safety training for applicators of public health pesticides. California Department of Public Health, Vector-Borne Disease Section, 1616 Capitol Avenue, MS7307, P.O. Box 997377, Sacramento.
- Ellman GL, Courtney KD, Andres V, Featherstone R.M (1961) A new and rapid colorimetric determination of acetylcholinesterase activity. Biochem Pharmacol. 7(2):91-95.
- Ender Y, Onder C (2006) Effects of dichlorvos on lipid peroxidation in mice on subacute and subchronic periods. Pestic Biochem Physiol. 86(2):106-109.
- Ermel K, Pahlich E, Schmutterer H (1984) Comparison of the azadirachtin content of neem seeds from ecotypes of Asian and African origin. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss) and other tropical plants. GTZ, Eschborn, Germany. pp 91-93.
- Ermel K, Pahlich E, Schmutterer H (1987) Azadirachtin content of neem kernels from different geographical locations and its dependence on temperature, relative hu-

- midity and light. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss) and other tropical plants. GTZ, Eschborn, Germany. pp 171-184.
- Fagoonee I (1984) Effect of azadirachtin and of a neem extract on food utilization by *Crocidolomia binotata*. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss) and other tropical plants. GTZ, Eschborn, Germany. pp 221-224.
- Farombi EO, Ajimoko YR, Adelowo OA (2008) Effect of butachlor on antioxidant enzyme status and lipid peroxidation in freshwater African catfish, *Clarias gariepinus*. Int J Environ Res Public Health. 5(5):423-427.
- Fetoui H, Garoui EM, Zeghal E (2009) Lambda-cyhalothrin-induced biochemical and histopathological changes in the liver of rats: ameliorative effect of ascorbic acid. Exp Toxicol Pathol. 61(3):189-196.
- Fleischmann A, Bertolote JM, Leo DD, Botega N, Phillips M, Sisask M, Vijayakumar L, Malakouti K, Schlebusch L, Silva DD, Nguyen VT, Wasserman D (2005) Characteristics of attempted suicides seen in emergency-care settings of general hospitals in eight low-and middle-income countries. Psychol Med. 35(10):1467-1474.
- Forman HJ (2009) Critical methods in free radical biology & medicine. Free Radic Biol Med. 47(Suppl 2):S207.
- Freeman BA, Crapo JD (1981) Hyperoxia increases oxygen radical production in rat lungs and lung mitochondria. J Biol Chem. 256(21):10986-10992.
- Garcia ES, Remboid H (1984) Effect of azadirachtin on ecdysis of *Rhodnius prolixus*. J Insect Physiol. 30:939-941.

- Garcia ES, Subrahmanyam B, Muller T, Remboid H (1989) Absorption, storage, organ distribution and excretion of dietary [22,23-³H₂] dihydroazadirachtin-A in the blood-feeding bug, *Rhodnius prolixus*. J Insect Physiol. 35:743-750.
- Garcia ES, Uhl M, Remboid H (1986) Azadirachtin, a chemical probe for the study of moulting process in *Rhodnius prolixus*. J Naturforsch. C41:771-775.
- Gavrilescu M (2005) Fate of pesticides in the environment and its bioremediation. Eng Life Sci. 5(6):497-526.
- Gunnell D, Eddleston M (2003) Suicide by intentional ingestion of pesticides: a continuing tragedy in developing countries. Int J Epidemiol. 32(6):902-909.
- Gustafsson AB, Gottlieb RA (2008) Heart mitochondria: gates of life and death. Cardiovasc Res. 77(2):334-343.
- Ha M-H, Choi J (2009) Effects of environmental contaminants on haemoglobin gene expression in *Daphnia magna*: a potential biomarker for freshwater quality monitoring. Arch Environ Contam Toxicol. 57(2):330-337.
- Hadwinger DF, Miller M (1979) Regulation of pesticide in the state of IOWA. J Res. 54(1):65-76.
- Hai DQ, Varga SI, Matkovics B (1997) Organophosphate effects on antioxidant system of Carp (*Cyprinus carpio*) and Catfish (*Italurus nebulosus*). Comp Biochem Physiol C Pharmacol Toxicol Endocrinol. 117(1):83-88.
- Halliwell B (1992) Reactive oxygen species and the central nervous system. J Neurochem. 59(5):1609-1623.
- Harborne JB (1982) Introduction to ecological biochemistry. 2nd ed. Academic press, London.
- Hayes WJJr (1975) Paper for the fourteenth annual meeting of the society of toxicology. William Virginia. March. 9-13.

- Hazra AK (1984) Ecology of the above ground and underground insect fauna in relation to the respective floral changes of botanic garden grassland, West Bengal, India. Proc Ani Sci. 93(7):675-689.
- Hazra AK, Barman RS, Mukherjee TK, Dey A, Mandal SK (1982) Ecology of grasshoppers in two grasslands of West Bengal, relation to some physical factors. Bull Zool Surv India. 4:309-317.
- Henderson R, McCrindle R, Overton KH, Melera A (1964) Salannin. Tetrahedron Lett. 5(52):3969-3974.
- Ho YS, Gargano M, Cao J, Bronson RT, Heimler I, Hutz RJ (1998) Reduced fertility in female mice lacking copper-zinc superoxide dismutase. J Biol Chem. 273(13):7765-7769.
- Hodgson E (2004) In: A textbook of modern toxicology. 3rd ed. John Wiley and Sons, Inc New Jersey. pp 203-211.
- Hoek JB, Pastorino JG (2002) Ethanol, oxidative stress and cytokine-induced liver cell injury. Alcohol. 27(1):63-68.
- Hogsette JA (1999) Management of ectoparasites with biological control organisms. Int J Parasitol. 29(1):147-151.
- Huc L, Tekpli X, Holme JA, Rissel M, Solhaug A, Gardyn C, Le-Moigne G, Gorria M, Dimanche-Boitrel MT, Lagadic-Gossmann D (2007) c-Jun NH₂-terminal kinase related Na⁺/H⁺ exchanger isoform 1 activation controls hexokinase II expression in benzo(a)pyrene-induced apoptosis. Cancer Res. 67(4):1696-1705.
- Hummel HE (1989) Natural products as biotechnical weapons towards the future pest management of *Diabrotica* beetles. Med Fac Landbouww Rijksuniv Ghent. 54(3a):945-954.

- Hussien HM, Abdou HM, Yousef MI (2013) Cypermethrin induced damage in genomic DNA and histopathological changes in brain and haematotoxicity in rats: The protective effect of sesame oil. *Brain Res Bull.* 92:76-83.
- Hutchinson G, Daisley H, Simeon D, Simmonds V, Shetty M, Lynn D (1999) High rates of paraquat-induced suicide in Southern Trinidad. *Suicide Life Threat Behav.* 29(2):186-191.
- Ingrisch S, Köhler G (1998) Die Heuschrecken (Orthoptera) österreichisch. In: zulka K (Red.). *Rote Listen gefährdeter Tiere Österreichs. Grüne Reihe.* 14(1):167-211.
- Isman MB (1997) Neem insecticides. *Pest Outlook.* 8:32-38.
- Isman MB (1994) Botanical insecticides. *Pestic Outlook.* 5:26-31.
- Isman MB (2004) Factors limiting commercial success of neem insecticides in North America and Western Europe. In: Koul O, Wahab S (eds) *Neem: today and in the new millennium.* Springer, Dordrecht, Kluwer Acad. pp 33-41.
- Jacobson M (1986) The neem tree: Natural resistance par excellence. *Am Chem Soc Symp Ser.* 296:220-232.
- Jamil K, Husain S (1992) Biotransfer of metals to the insect *Neochetina eichhorniae* via aquatic plants. *Arch Environ Contam Toxicol.* 22(4):459-463.
- Jana G, Misra KK, Bhattacharya T (2006) Diversity of some insect fauna in industrial and non-industrial areas of West Bengal, India. *J Insect Conserv.* 10(3):249-260.
- Jeyaratnam J (1985) Health problems of pesticide usage in the third world. *Br J Ind Med.* 42(8):505-506.
- Joern A, Pruess KP (1986) Temporal constancy in grasshopper assemblies (Orthoptera: Acrididae). *Ecol Entomol.* 11(4):379-385.

- Jonas JL, Joern A (2007) Grasshopper (Orthoptera: Acrididae) communities respond to fire, bison grazing and weather in North American tallgrass prairie: a long-term study. *Oecologia*. 153(3):699-711.
- Joshi BG, Ramprasad G, Satyanarayana VV (1978) Relative efficacy of neem kernel, fentin acetate and fentin hydroxide as antifeedants against tobacco caterpillar, *Spodoptera litura* Fabricius in the nursery. *Indian J Agric Sci*. 48:19-22.
- Jotwani MG, Srivastava KP (1984) A review of neem research in India in relation to insects. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss) and other tropical plants. GTZ, Eschborn, Germany. pp 43-56.
- Kale M, Rathore N, John S, Bhatnagar D (1999) Lipid peroxidative damage on pyrethroid exposure and alterations in antioxidant status in rat erythrocyte: a possible involvement of reactive oxygen species. *Toxicol Lett*. 105(3):197-205.
- Karpeta-Kaczmarek J, Kubok M, Dziewiecka M, Sawczyn T, Augustyniak M (2016) The level of DNA damage in adult grasshoppers *Chorthippus biguttulus* (Orthoptera, Acrididae) following dimethoate exposure is dependent on the insects' habitat. *Environ Pollut*. 215:266-272.
- Kati V, Zografou K, Tzirkalli E, Chitos T, Willemse L (2012) Butterfly and grasshopper diversity patterns in humid Mediterranean grasslands: the roles of disturbance and environmental factors. *J Insect Conserv*. 16:807-818.
- Kaynar H, Meral M, Turhan H, Keles M, Celik G, Akcay F (2005) Glutathione peroxidase, glutathione-S-transferase, catalase, xanthine oxidase, Cu-Zn superoxide dismutase activities, total glutathione, nitric oxide, and malondialdehyde levels in erythrocytes of patients with small cell and non-small cell lung cancer. *Cancer Lett*. 227(2):133-139.

- KeBler T, Cierjacks A, Ernst R, Dziock F (2012) Direct and indirect effects of ski run management on alpine Orthoptera. *Biodivers Conserve.* 21(21):281-296.
- Kim JL, Jung CS, Koh YH, Lee SH (2006) Molecular, biochemical and histochemical-characterization of two acetylcholinesterase cDNAs from the German cockroach *Blattella germanica*. *Insect Mol Biol.* 15(4):513-522.
- Kishi M, Ladou J (2001) International pesticide use. Introduction. *Int J Occup Environ Health.* 7(4):259-265.
- Klaunig JE, Xu Y, Isenberg JS, Bachowski S, Kolaja KL, Jiang J, Stevenson DE, Walborg EF Jr (1998) The role of oxidative stress in chemical carcinogenesis. *Environ Health Perspect.* 106(Suppl 1):289-295.
- Klein M, Shlomit L, Sarakeran (1983) Comparative toxicology of several pyrethroids, parathion and chlorpyriphos to adults of the spiny bull worm, *Earias insulana* (Lepidoptera: Noctuidea) in laboratory assays. *ISR J Entomol.* 16:99-104.
- Koch I, Mace JV, Reimer KJ (2005) Arsenic speciation in terrestrial birds from Yellowknife, Northwest Territories, Canada: the unexpected finding of Arsenobetaine. *Environ Toxicol Chem.* 24(6):1468-1474.
- Kono Y, Fridovich I (1982) Superoxide radical inhibits catalase. *J Biol Chem.* 257(10):5751-5754.
- Koul O (1984) Azadirachtin: I-Interaction with the development of red cotton bugs. *Entomol Exp et Appl.* 36(1):85-88.
- Koul O, Amanai K, Ohtaki T (1987) Effect of azadirachtin on the endocrine events of *Bombyx mori*. *J Insect Physiol.* 33(2):103-108.
- Koul O, Shankar JS, Kapil RS (1996) The effect of neem allelochemicals on nutritional physiology of larval *Spodoptera litura*. *Entomol Exp et Appl.* 79(1):43-50.

- Kumar DJS (2002) Toxic potentials of chlorpyriphos and azadirachtin on fresh water edible fish *Tilapia mossambica* (Peters). Ph.D. Thesis. Sri Venkateswara University, Tirupati, (AP), India. pp 67-68.
- Kyvic KR, Bente EM (1995) Environmentally hazardous substances and the nervous system. Tidsskr Nor Laegeforen. 115:1834 -1838.
- Laszlo A, Matkovics B, Varge SI, Wittman T, Fazekas T, (1991) Changes in lipid peroxidation and antioxidant enzyme activity of human red blood cells after myocardial infarction. Clin Chim Acta. 203(2-3):413-415.
- Lavie D, Jain NK, Shapan-Cabrielith SR (1967) A locust phagorepellent from two melia species. J Chem Soc Chem Commun. 910-911.
- Ley SV, Denholm AA, Wood A (1993) The chemistry of azadirachtin. Nat Prod Rep. 10(2):109-157.
- Li R, Jia Z, Trush MA (2016) Defining ROS in biology and medicine. React Oxyg Species (Apex). 1(1):9-21.
- Lin T, Liu Q, Chen J (2016) Identification of differentially expressed genes in *Monochamus alternatus* digested with azadirachtin. Sci Rep. 6:33484.
- Linton YM, Nisbet AJ, Mordue AJL (1997) The effects of azadirachtin on the testes of the desert locust, *Schistocerca gregaria* (Forskål). J. Insect Physiol. 43(11):1077-1084.
- Liu JJ, Guo C, Wang B, Shi M-X, Yang Y, Yu Z, Meng X-H, Xu D-X (2018) Maternal fenvalerate exposure during pregnancy impairs growth and neurobehavioral development in mouse offspring. PLoS One. 13(10):e0205403.
- Lobo V, Patil A, Phatak A, Chandra N (2010) Free radicals, antioxidants and functional foods: impact on human health. Pharmacogn Rev. 4(8):118-126.

- Lowry OH, Rosebrough NJ, Farr AL, Randall RJ (1951) Protein measurement with the folin phenol reagent. *J Biol Chem.* 193(1):265-275.
- Lynn OM, Kim JE, Lee KY (2012) Effects of azadirachtin on the development and gene expression of fifth instar larvae of Indian meal moth, *Plodia interpunctella*. *J Asia-Pacif Ent.* 15:101-105.
- Maiti PK, Gupta P, Chaurasia SS, Kar A (1996) Dimethoate induced lipid peroxidation and inhibition of type-1 iodothyronine 5'-monodeiodinase activity in young cockerel. *Bull Environ Contam Toxicol.* 57:335-340.
- Maiti PK, Kar A, Gupta P, Chaurasia SS (1995) Loss of membrane integrity and inhibition of type-I iodothyronine 5'-monodeiodinase activity by fenvalerate in female mouse. *Biochem Biophys Res Commun.* 214(3):905-909.
- Malczewska M, Gelman DB, Cymborowski B (1988) Effect of azadirachtin on development, juvenile hormone and ecdysteroid titres in chilled *Galleria mellonelia* larvae. *J Insect Physiol.* 34(7):725-732.
- Manikanta P, Dokuparthi SK (2014) A review on role of *Azadirachta indica* A. Juss as a biopesticide. *Int J Univers Pharm Bio Sci.* 3(2):112-121.
- Marini L, Fontana P, Scotton M, Klimek S (2008) Vascular plant and Orthoptera diversity in relation to grassland management and landscape composition in the European Alps. *J. Appl. Ecol.* 45(1):361-370.
- Marnett LJ (2000) Oxyradicals and DNA damage. *Carcinogenesis.* 21(3):361-370.
- Martinez D, Chaffiol A, Voges N, Gu Y, Anton S, Rospars J-P, Lucas P (2013) Multi-phasic on/off pheromone signalling in moths as neural correlates of a search strategy. *PLoS One.* 8(4):e61220.
- Mathur SC (1999) Future of Indian pesticides industry in next millennium. *Pesticide Information.* 24(4):9-23.

- McCabe C, Anderson OS, Montrose L, Neier K, Dolinoy DC (2017) Sexually dimorphic effects of early-life exposures to endocrine disruptors: sex-specific epigenetic re-programming as a potential mechanism. *Curr Environ Health Rep.* 4(4):426-438.
- Meffe GK, Carroll CR (1994) In: *Principles of Conservation Biology*. Sinauer Associates, Inc Sunderland, Massachusetts. pp 600.
- Meharg AA, Rahman M (2003) Arsenic contamination of Bangladesh paddy field soils: implications of rice contribution to arsenic consumption. *Environ Sci Technol.* 37(2):229-234.
- Meister A, Tate SS (1976) Glutathione and related gamma-glutamyl compounds: biosynthesis and utilization. *Annu Rev Biochem.* 45:599-604.
- Mekail A, Sharafaddin AH (2009) A study of the activity of catalase and glutathione S-transferase in weanling and adult rats intoxicated with diazinon, carbaryl and lambda-cyhalothrin. *J Duhok Uni.* 12:138-145.
- Miller GT (2004) In: *Sustaining the Earth: an integrated approach*. Thomson Brooks/Cole. pp 211-216.
- Milne GL, Seal JR, Havrilla CM, Wijtmans M, Porter NA (2005) Identification and analysis of products formed from phospholipids in the free radical oxidation of human low density lipoproteins. *J Lipid Res.* 46(2):307-319.
- Mishra M, Sharma A, Shukla AK, Kumar R, Dwivedi UN, Kar Chowdhuri D (2014) Genotoxicity of dichlorvos in strains of *Drosophila melanogaster* defective in DNA repair. *Mutat Res Genet Toxicol Environ Mutagen.* 15(766):35-41.
- Møller AP, Mousseau TA (2011) Efficiency of bio-indicators for low level radiations under field conditions. *Ecol Indicator.* 11(2):424-430.
- Molyneux P (2004) The use of the stable free radical diphenylpicrylhydrazyl (DPPH) for estimating antioxidant activity. *Songklanakarin J Sci Technol.* 26(2):211-219.

- Monteiro DA, de Almeida JA, Rantin FT, Kalinin AL (2006) Oxidative stress biomarkers in the freshwater characid fish, *Brycon cephalus*, exposed to organophosphorus insecticide folisuper 600 (methyl parathion). Comp Biochem Physiol C Toxicol Pharmacol. 143(2):141-149.
- Moranz RA, Debinski DM, McGranahan DA, Engle DM, Miller JR (2012) Untangling the effect of fire, grazing, and land-use legacies on grassland butterflies communities. Biodivers Conserve. 21:2719-2746.
- Mordue AJL, Blackwell A (1993) Azadirachtin: an update. J Insect Physiol. 39(11):903-924.
- Mordue AJL, Evans KA, Charlet M (1986) Azadirachtin, ecdysteroids and ecdysis in *Locusta migratoria*. Comp Biochem Physiol. 85C:297–301.
- Mordue AJL, Morgan ED, Nisbet AJ (2010) Azadirachtin, a natural product in insect control. In: Gilbert LI, Iatrou K, Gill SS (eds) Comprehensive molecular insect science. Elsevier, Amsterdam. pp 117-134.
- Mordue AJL, Nisbet AJ (2000) Azadirachtin from the neem tree *Azadirachta indica*: its action against insects. An Soc Entomol Brasil. 29(4):615-632.
- Mordue AJL, Nisbet AJ, Jennens L, Ley SV, Mordue W (1999) Tritiated dihydroazadirachtin binding to *Schistocerca gregaria* testes and Spodoptera Sf9 cells suggests a similar cellular mechanism of action for azadirachtin. In: Singh RP, Saxena RC (eds) *Azadirachta indica* A. Juss. Int Neem Conf. Gatton, Australia, Oxford and IBH Publ Co Pvt Ltd. pp 247-258.
- Mordue AJL, Nisbet AJ, Nasiruddin M, Walker E (1996) Differential thresholds of azadirachtin for feeding deterrence and toxicity in locusts and an aphid. Entomol Exp Appl. 80:69-72.

- Mordue AJL, Simmonds MSJ, Ley SV, Blaney WM, Mordue W, Nasiruddin M, Nisbet AJ (1998) Actions of azadirachtin, a plant allelochemical, against insects. Pestic Sci. 54(3):277-284.
- Mordue AJL, Zounos A, Wickramananda IR, Allan EJ (1995) Neem tissue culture and the production of insect antifeedant and growth regulatory compounds. BCPC Symp. Proceed. 63:187-194.
- Moreno OA, Vazquez-Duhalt R, Nolasco H (1990) Extracellular accumulation of high specific-activity peroxidase by cell suspension cultures of cowpea. Plant Cell Rep. 9(3):147-150.
- Morgan ED (1981) Strategy in the isolation of insect control substances from plants. In: Schmutterer H, Ascher KRS, Rembold H (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss). GTZ, Eschborn, Germany. pp 43-52.
- Morgan ED (2009) Azadirachtin, a scientific gold mine. Bioorg Med Chem. 17 (12):4096-4105.
- Mousa MAA, El-Ashram AMM, Hamed M (2008): Effect of neem leaf extract on freshwater fishes and zooplankton community. Proc 8th Int Symp on Tilapia in Aquaculture. Central Laboratory for Aquaculture Research. Cairo, Egypt. pp 307-318.
- Mukherji SM, Singh SP (1986) Reaction mechanism in organic chemistry. Madras, Macmillan India Press.
- Nagini S (2014) Neem limonoids as anticancer agents: Modulation of cancer hallmarks and oncogenic signalling. Enzymes. 36:131-147.
- Naqvi SNH (1987) Biological evaluation of fresh neem extracts and some neem components, with reference to abnormalities and esterase activity in insects. In: Schmutterer H, Ascher KRS (eds) Proc 3rd Int Neem Conf. Nairobi, GTZ, Eschborn, Germany. pp 315-330.

- Nath S, Rai A, Gurung K, Das M, Pradhan N, Burman S, Haldar P (2008) Comparison of heavy metals level in grasses and grasshoppers from Darjeeling hills. J Hill Res. 21(2):67-69.
- Naveed A, Janaiah C (2011) Effect of Triazophos on protein metabolism in the fish, *Channa punctatus* (Bloch). Curr Res J Biol Sci. 3(2):124-128.
- Nemcsók J, Bálint T, Fazakas J, Kátai F, Kiss I, Hieu LH, Kufcsak O, Láng G, Polyhos C, Szabó I, Szegletes T (1999) The contribution of a pyrethroid insecticide to the massive eel (*Anguilla anguilla*) devastation in lake Balaton, in 1995. Acta Biol Hung. 50(1-3):161-173.
- Nisbet AJ (2000) Azadirachtin from the neem tree *Azadirachta indica*: its action against insects. An Soc Entomol Bras 29(4):615-632.
- Nisbet AJ, Mordue AJL, Mordue W (1995) Detection of [22, 23-³H₂] dihydroazadirachtin binding sites on membranes from *Schistocerca gregaria* (Forskål) testes membranes. Insect Biochem Mol Biol. 25(5):551-557.
- Nisbet AJ, Mordue AJL, Mordue W, Williams LM, Hannah L (1996) Autoradiographic localisation of [22,23-³H₂] dihydroazadirachtin binding sites in desert locust testes. Tissue Cell. 28:725-729.
- Nisbet AJ, Woodford JAT, Strang RHC, Connolly JD (1993) Systematic antifeedant effects of azadirachtin on the peach-potato aphid *Myzus persicae*. Entomol Exp et Appl. 68(1):87-98.
- Nouri-Ganbalani G, Borzouei E, Abdolmaleki A, Abedi Z, George Kamita S (2016). Individual and combined effects of *Bacillus thuringiensis* and Azadirachtin on *Plodia interpunctella* Hübner (Lepidoptera: Pyralidae). J Insect Sci. 16(1):1-8.

- Nufio CR, McCleanahan JL, Bowers MD (2011) Grasshopper response to reductions in habitat area as mediated by subfamily classification and life history traits. J Insect Conserv. 15(3):409-419.
- Okhawa H, Ohishi N, Yagi K (1979) Assay for lipid peroxides in animal tissues by thiobarbituric acid reaction. Anal Biochem. 95(2):351-358.
- Oliver K, Liu J, Karanth S, Zhang H, Roane DS, Pope CN (2001) Glucose feeding exacerbates parathion-induced neurotoxicity. J Toxicol Environ Health. 63(4):253-271.
- Ondreicka R, Beno I, Cerna O, Granicova E, Staruchowa M, Volkova K, Bobek P, Tatara M (1998) Relationship between levels of vitamins C, E, A and beta-carotene and activity of antioxidant enzymes in the blood. Bratisl Lek Listy. 99(5):250-254.
- Oppert C, Klingeman WE, Willis JD, Oppert B, Jurat-Fuentes JL (2010) Prospecting for cellulolytic activity in insect digestive fluids. Comp Biochem Physiol B Biochem Mol Biol. 155(2):145-154.
- Otto DME, Moon TW (1995) 3,3',4,4'-tetrachlorobiphenyl effects on antioxidant enzymes and glutathione status in different tissues of rainbow trout. Pharmacol Toxicol. 77(4):281-287.
- Pajoumand A, Jalali N, Abdollah M, Shadnia S (2002) Survival following severe aluminum phosphide poisoning. J Pharm Pract Res. 32(4):297-299.
- Pal AK, Kushwah HS (1981) A preliminary study on protective role of protein against endosulphon exposure. Ind J Biophys Biochem. 8:4-10.
- Pandey S, Parvez S, Sayeed I, Haque R, Bin-Hafeez B, Raisuddin S (2003) Biomarkers of oxidative stress: a comparative study of river Yamuna fish *Wallago attu* (Bl. & Schn.). Sci Total Environ. 309(1-3):105-115.
- Parmar BS (1987) An overview of neem research and use in India during the years 1983-1986. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem tree

- (*Azadirachta indica* A. Juss) and other tropical plants. GTZ, Eschborn, Germany. pp 55-80.
- Paschetta M, Morgia VL, Masante D, Negro M, Rolando A, Isaia Marco (2012) Grazing history influences biodiversity: a case study on ground-dwelling arachnids (Arachnidae: Araneae, Opiliones) in the Natural Park of Alpi Marittime (NW Italy). *J Insect Conserv.* 17(2):339-356.
- Pascoli M, Jacques MT, Agarrayua DA, Avila DS, Lima R, Fraceto LF (2019) Neem oil based nanopesticide as an environmentally friendly formulation for applications in sustainable agriculture: an ecotoxicological perspective. *Sci Total Environ.* 677:57-67.
- Pearson DL (1994) Selecting indicator taxa for the quantitative assessment of biodiversity. *Philos Trans R Soc Lond B Biol Sci.* 345(1311):75-79.
- Perry AS, Yamamoto I, Ishaaya I, Perry R (1998) Introduction to insecticides. In: *Insecticides in agriculture and environment, restrospects and prospects*, (eds. Mc Neal BL, Tardieu F, Van KH, Van Neck D), Narosa publishing house, Springer Verlag. Berlin, 1st Ed.
- Pham-Huy LA, He H, Pham-Huy C (2008) Free radicals, antioxidants in disease and health. *Int J Biomed Sci.* 4(2):89-96.
- Phaniendra A, Jestadi DB, Periyasamy L (2015) Free radicals: properties, sources, targets, and their implication in various diseases. *Ind J Clin Biochem.* 30(1):11-26.
- Pickrell AM, Fukui H, Moraes CT (2009) The role of cytochrome c oxidase deficiency in ROS and amyloid plaque formation. *J Bioenerg Biomembr.* 41(5):453-456.
- Poory YJ, Lindgren S, Salminen J, Kuussaari M (2005) Responses of butterfly and moth species to restored cattle grazing in semi-natural grasslands. *Bio Consrv.* 122:465-478.

- Pradhan S, Jotwani MG, Rai BK (1962) The neem seed deterrent to locusts. Indian Fmg. 12(8):7-11.
- Pradhan S, Jotwani MG, Rai BK (1963) The repellent properties of some neem products. Bull Reg Res Lab. 1:149-150.
- Prakasam A, Sethupathy S, Lalitha S (2001) Plasma and RBCs antioxidant status in occupational male pesticide sprayers. Clin Chim Acta. 310(2):107-112.
- Price JF, Schuster DJ (1991) Effects of natural and synthetic insecticides on sweet potato white fly *Bemisia tabaci* (Homoptera: Aleyrodidae) and its hymenopterous parasitoids. Fla Entomol. 74:60-68.
- Radcliffe EB, Dunkel FV, Strzok PP, Adam S (1991) Antifeedant effect of neem, *Azadirachta indica* A. Juss. kernel extracts on *Kraussaria angulifera* Krauss (Orthoptera: Acrididae), a Sahelian grasshopper. Trop Agric. 68:95-101.
- Raguraman S, Singh RP (1999) Biological effects of neem (*Azadirachta indica*) seed oil on an eggs parasitoid, *Trichogramma chilonis*. J Econ Entomol. 92(6):1274-1280.
- Rao PJ, Subrahmanyam B (1986) Azadirachtin induced changes in development, food utilization and haemolymph constituents of *Schistocerca gregaria* Forskal. J Appl Entomol. 102(1-5):217-244.
- Rembold H (1989) Azadirachtins: their structure and mode of action. In: Arnason JT, Philogene BJR, Morand P (eds) Insecticides of plant origin. ACS Symp Series 387. American Chemical Society, Washington, DC. pp 150-163.
- Rembold H, Forster H, Czoppelt CH, Rao PJ, Sieber KP (1984) The azadirachtins, a group of insect growth regulators from the neem tree. In: Schmutterer H, Ascher KRS. Proc 2nd Neem Conf. Rauischholzhausen, Germany. pp 153-162.

- Rembold H, Müller Th, Subrahmanyam B (1988) Tissue specific incorporation of azadirachtin, in the malpighian tubules of *Locusta migratoria*. Z. Naturforsch. C43:903-907.
- Rembold H, Sieber KP (1981) Inhibition of oogenesis and ovarian ecdysteroid synthesis by azadirachtin in *Locusta migratoria* (R and F). Z Naturforsch. C36:466-469.
- Rembold H, Uhl M, Muller Th (1987) Effect of azadirachtin A on hormonal titres during the gonadotropic cycle of *Locusta migratoria*. In: Schmutterer H, Ascher JRS (eds) Natural Pesticides from the neem tree (*Azadirachta indica* A. Juss) and other tropical plants. GTZ, Eschborn, Germany. pp 289-298.
- Rice-Evans CA, Miller NJ, Paganga G (1996) Structure-antioxidant activity relationships of flavonoids and phenolic acids. Free Radic Biol Med. 20(7):933-956.
- Rizzo AM, Berselli P, Zava S, Montorfano G, Negroni M, Corsetto P, Berra B (2010) Endogenous antioxidants and radical scavengers. Adv Exp Med Biol. 698:52-67.
- Ruscoe CNE (1972) Growth disruption effects of an insect antifeedant. Nature New Biol. 236(66):159-160.
- Sakamuru S, Attene-Ramos MS, Xia M (2016) Mitochondrial membrane potential assay. Methods Mol Biol. 1473: 17-22.
- Sakharov IYu, Makarova IE, Ermolin GA (1989) Chemical modification and composition of tetrameric isozyme K of alkaline phosphatase from harp seal intestinal mucosa. Comp Biochem Physiol B. 92(1):119-122.
- Sami AJ, Shakoori AR (2007) Extracts of plant leaves have inhibitory effects on the cellulase activity of whole body extracts of insects-a possible recipe for bioinsecticides. Proc Pakistan J Zool. 27:105-118.

- Sami AJ, Shakoori AR (2011) Cellulase activity inhibition and growth retardation of associated bacterial strains of *Aulacophora foveicollis* by two glycosylated flavonoids isolated from *Mangifera indica* leaves. J Med Plant Res. 5(2):184-190.
- Sami AJ, Shakoori AR (2014) Potential of azadirachtin and neem (*Azadirachta indica*) based saponins as biopesticides for in vitro insect pest's cellulase (Beta-1,4-endoglucanase) enzyme inhibition and in vivo repellency on *Tribolium castaneum*. Biotechnol J Int. 4(8):904-917.
- Samways MJ (1994) In: Insect conservation biology, Chapman and Hall, London. UK. pp 358.
- Saxena RC, Jilani G, Abdul Kareem A (1988) Effects of neem on stored grain insects. In: Jacobson M (eds) Focus on phytochemical pesticides, vol 1. The neem tree. CRC, Boca Raton, FL. pp 97-112.
- Sayeed I, Parvez S, Pandey S, Bin-Hafeez B, Haque R, Raisuddin S (2003) Oxidative stress biomarkers of exposure to deltamethrin in freshwater fish, *Channa punctatus* Bloch. Ecotoxicol Environ Saf. 56(2):295-301.
- Schauer M (1984) Effects of various formulated neem seed extracts on homopterous insects. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss) and other tropical plants. CTZ, Germany. pp 141-149.
- Schmidt GH, Ibrahim NM, Abdallah MD (1991) Toxicological studies on the long-term effects of heavy metals (Hg, Cd, Pb) in soil on the development of *Aiolopus thalassinus* (Fabr.) (Saltatoria: Acrididae). Sci Total Environ. 107:109-133.
- Schmitz OJ (2005) Scaling from plot experiments of landscapes: studying grasshoppers to inform forest ecosystem management. Oecologia. 145(2):225-234.

- Schmutterer H (1981) Ten years of neem research in Federal Republic of Germany. In: Schmutterer H, Ascher KRS, Rembold H (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss). GTZ, Eschborn, Germany. pp 21-32.
- Schmutterer H (1984) Neem research in Federal Republic of Germany since the first international neem conference. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem (*Azadirachta indica* A. Juss) and other tropical plants. GTZ, Eschborn, Germany. pp 21-30.
- Schmutterer H (1985) Which insect pests can be controlled by application of neem seed kernel extracts under field conditions? Z Angew Entomol. 100(1-5):468-475.
- Schmutterer H (1987) Fecundity reducing and sterilizing effects of neem seed kernel extracts in the colorado potato beetle, *Leptinotarsa decemlineata*. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem (*Azadirachta indica* A. Juss) and other tropical plants. GTZ, Eschborn, Germany. pp 351-360.
- Schmutterer H (1990) Properties and potential of natural pesticides from the neem tree, *Azadirachta indica*. Annu Rev Entomol. 35(1):271-297.
- Schmutterer H (1992) Einfluß von Azadirachtin, einer azadirachtinfreien Fraktion eines alkoholischen Niemsamenextraktes und von formulierten Extrakten auf Verpupfung, Schlupf und Imagines der Kohlweißlingsbrackwespe *Apanteles glomeratus* (L.) (Hym., Braconidae). J. Appl. Entomol. 113:79-87.
- Schmutterer H (2002). In: The neem tree. Mumbai Neem Found. pp 892.
- Schoonhoven LM, Jermy T (1977) A behavioural and electrophysiological analysis of insect feeding deterrents. In: McFarlane NR (eds) Crop protection agents-their biological evaluation. Academic Press, London. pp 133-146.
- Schultz WD (1981) Histo-pathological alterations in the ovaries of *Epilachna varivestis* induced by an extract from neem kernels. In: Schmutterer H and Ascher KRS (eds)

- Natural pesticides from the neem tree (*Azadirachta indica* A. Juss). Proc 1st Int Neem Conf. GTZ, Eschborn, Germany. pp 81-97.
- Schwarzbacherová V, Wnuk M, Lewinska A, Potocki L, Zebrowski J, Koziorowski M, Holečková B, Šivíková K, Dianovský J (2017) Evaluation of cytotoxic and genotoxic activity of fungicide formulation Tango® Super in bovine lymphocytes. Environ Pollut. 220(Pt A):255-263.
- Senthil-Nathan S, Chung PG, Murugan K (2004) Effect of botanical insecticides and bacterial toxin on the gut enzyme of *Cnaphalocrocis medinalis*. Phytoparasitica. 32:433-443.
- Senthil-Nathan SS (2006) Effects of *Melia azedarach* on nutritional physiology and enzyme activities of the rice leaffolder *Cnaphalocrocis medinalis* (Guenée) (Lepidoptera: Pyralidae). Pestic Biochem Physiol. 84:98-108.
- Shaaya E, Rafaeli A (2007) Essential oils as biorational insecticides-potency and mode of action. In: Ishaaya I, Nauen R, Horowitz R (eds) Insecticides design using advanced technologies. Springer, Berlin, Heidelberg, Germany. pp 249-261.
- Sharma DC, Saxena PN, Singh VK, Sharma R (2010) Assessment of DNA degradation in lymphocytes of albino rat (*Rattus norvegicus*) under lambda cyhalothrin stress. World Appl Sci J. 11(1):24-28.
- Sharma DK, Ansari BA (2013) Effects of deltamethrin on CAT, LPO and GSH in tissues of Zebrafish *Danio rerio*. Res J Environ Toxicol. 7(1):38-46.
- Sharma HC, Norris DM (1991) Comparative feeding preference and food intake and utilization by the cabbage looper (Lepidoptera: Noctuidae) on three legume species. Environ Entomol. 20(6):1589-1594.

- Shimizu T (1988) Suppressive effects of azadirachtin on spermiogenesis of the diapausing cabbage armyworm, *Mamestra brassicae*, in vitro. Entomol Exp et Appl. 46(2):197-199.
- Shu B, Zhang J, Cui G, Sun R, Yi X, Zhong G (2018) Azadirachtin affects the growth of *Spodoptera litura* Fabricius by inducing apoptosis in larval midgut. Front Physiol 9:1-12.
- Shukla G, Kumar A, Bhanti M, Joseph PE, Taneja A (2006) Organochlorine pesticide contamination of ground water in the city of Hyderabad. Environ Int. 32(2):244-247.
- Sieber KP, Rembold H (1983) The effects of azadirachtin on the endocrine control of moulting in *Locusta migratoria*. J insect Physiol. 29(6):523-527.
- Simmonds MSJ, Manlove JD, Blaney WM, Khambay BPS (2002) Effects of selected botanical insecticides on the behaviour and mortality of the glasshouse whitefly *Trialeurodes vaporariorum* and the parasitoid *Encarsia formosa*. Entomol Exp et Appl. 102(1):39-47.
- Singh D, Jit I, Tyagi S (1999) Changing trends in acute poisoning in Chandigarh zone: a 25- year autopsy experience from a tertiary care hospital in Northern India. Am J Forensic Med Pathol. 20(2):203-210.
- Sivakumar S, Mohan M, Franco OL, Thayumanavan B (2006) Inhibition of insect pest α -amylases by little and finger millet inhibitors. Pest Biochem Physiol. 85(3):155-160.
- Šivíková K, Holečková B, Schwarzbacherová V, Galdíková M, Dianovský J (2018) Potential chromosome damage, cell-cycle kinetics/and apoptosis induced by epoxiconazole in bovine peripheral lymphocytes in vitro. Chemosphere. 193:82-88.

- Slansky F Jr, Rodriguez JG (1987) Nutritional ecology of insects, mites, spiders and related invertebrates: an overview. In: Slansky F Jr, Rodriguez JG (eds) Nutritional ecology of insects, mites, spiders and related invertebrates. Wiley and Sons, NY. pp 1-69.
- Smietanko A, Engelmann W (1989) Splitting of circadian rhythm of *Musca domestica* flies with azadirachtin. *J Interdiscipl Cycle Res.* 20(1):71-79.
- Smith SL, Mitchell MJ (1988) Effects of azadirachtin on insect cytochrome P-₄₅₀ dependent ecdysone 20-monooxygenase activity. *Biochem Biophys Res Commun.* 154(2):559-563.
- Somashekaraiah BV, Padmaja K, Prasad ARK (1992) Lead-induced lipid peroxidation and antioxidant defense components of developing chick embryos. *Free Radic Biol Med.* 13(2):107-114.
- Sowers JR (2002) Hypertension, angiotensin II and oxidative stress. *N Engl J Med.* 346(25):1999-2001.
- Spollen KM, Isman MB (1996) Acute and sublethal effects of a neem insecticide on the commercial biological control agents *Phytoseiulus persimilis* and *Amblyseius cucumeris* (Acari: Phytoseiidae), and *Aphidoletes aphidimyza* (Rondani) (Diptera: Cecidomyiidae). *J Econ Entomol.* 89:1379-1386.
- Stadtman ER, Levine RL (2000) Protein oxidation. *Ann N Y Acad Sci.* 899(1):191-208.
- Stark JD, Walter JF (1995) Persistence of azadirachtin A and B in soil: effects of temperature and microbial activity. *J Environ Sci Health B.* 30(5):685-698.
- Steck CE, Bürgi M, Bolliger J, Kienast F, Lehmann A, Gonseth Y (2007) Conservation of grasshopper diversity in a changing environment. *Biol Conserv.* 138:360-370.

- Steets R, Schmutterer H (1975) The effect of azadirachtin on the longevity and reproduction of *Epilachna varivestis* Muls. (Coleoptera, Coccinellidae). J Plant Dis Protect. 82(3):176-179.
- Steffens RJ, Schmutterer H (1982) The effect of crude methanolic neem (*Azadirachta indica*) seed kernel extract on metamorphosis and quality of the Mediterranean fruitfly, *Ceratitis capitata* Wied. (Diptera, Tephritidae). Z Angew Entomol. 94(1-5):98-103.
- Stevenson DE, Kehrer JP, Kolaja KL, Walborg EF, Klaunig JE (1995) Effect of dietary antioxidants on dieldrin-induced hepatotoxicity in mice. Toxicol Lett. 75(1-3):177-183.
- Subrahmanyam B, Müller T, Rembold H (1989) Inhibition of turnover of neurosecretion by azadirachtin in *Locusta migratoria*. J Insect Physiol. 35:493-500.
- Subrahmanyam B, Rembold H (1989) Effect of azadirachtin-A on neuroendocrine activity in *Locusta migratoria*. Cell Tissue Res. 256:513-517.
- Sundararaj R, Murugesan S, Ahmed SI (1995) Differential impact of NSKP extracts on nutrition and reproduction of *Taragama siva* Lefebvre (Lepidoptera: Lasicocampidae). Entomon. 20:257-261.
- Sundernath P, Ramesh Babu T, Raman Rao KV (1987) Toxicity of Kelthane and its impact on behavioural responses to peanoid prawn, *Metapeneus monocerus*. Environ. Ecol. 5(4):782-785.
- Talpur AD, Ikhwanuddin M (2013) *Azadirachta indica* (neem) leaf dietary effects on the immunity response and disease resistance of Asian seabass, *Lates calcarifer* challenged with *Vibrio harveyi*. Fish Shellfish Immunol. 34(1):254-264.
- Tandon SK, Khera S (1978) Ecology and Distribution of grasshoppers (Orthoptera: Acridoidea) in Arunachal Pradesh, India and impact of human activities on their

- ecology and distribution. Proceeding of the seminar on Impact of Man on the Mountain Ecosystem. In: Mem School of Entom. No. 6, Agra. 6:73-91.
- Tang ZH (2000) Research status and perspectives of insect resistance to insecticides in China. *Entomol Knowledg.* 37:97-103.
- Tappel AL (1973) Lipid peroxidation damage to cell components. *Fed Proc.* 32(8):1870-1874.
- Thomas JA, Telfer MG, Roy DB, Preston CD, Greenwood JJD, Asher J, Fox R, Clarke RT, Lawton JH (2004) Comparative losses of British butterflies, birds, and plants and the global extinction crisis. *Science.* 303(5665):1879-1881.
- Timmins WA, Reynolds SE (1992) Azadirachtin inhibits secretion of trypsin in midgut of *Manduca sexta* caterpillars: reduced growth due to impaired protein digestion. *Entomol Exp et Appl.* 63(1):47-54.
- Tripathi G, Singh H (2013) Impact of alphamethrin on biochemical parameters of *Channa punctatus*. *J Environ Biol.* 34(2):227-230.
- Tripathi G, Verma P (2004) Fenvalerate-induced changes in a catfish, *Clarias batrachus*: metabolic enzymes, RNA and protein. *Comp Biochem Physiol C Toxicol Pharmacol.* 138(1):75-79.
- Tsan MF (1993) Superoxide dismutase and pulmonary oxygen toxicity. *Proc Soc Exp Biol Med.* 203(3):286-290.
- Turi MS, Soos K, Vegh E (2000) Determination of residues of pyrethroid and organophosphorous ectoparasiticides in foods of animal origin. *Acta Vet Hung.* 48(2):139-149.
- Uvarov BP (1961) Quantity and quality in insect populations. *Proc R Ent Soc Lond Ser C.* 25(11):52-59.

- Uvarov BP (1977) Grasshoppers and locusts: a handbook of general acridology. Vol. 2
Published by Centre for Overseas Pest Research, London.
- Valavanidis A, Vlahogianni, T, Dassenakis M, Scoullos M (2006) Molecular biomarkers of oxidative stress in aquatic organisms in relation to toxic environmental pollutants. *Ecotoxicol Environ Saf*. 64(2):178-189.
- Valko M, Leibfritz D, Moncol J, Cronin MTD, Mazur M, Telser J (2007) Free radicals and antioxidants in normal physiological functions and human disease. *Int J Biochem Cell Biol*. 39(1):44-84.
- Volkonsky M (1937) Sur un procede nouveau de protection des cultures contre les acrides. *C R Soc Biol*. 125:417-418.
- Waldbauer GP (1968) The consumption and utilization of food by insects. *Adv Insect Physiol*. 5:229-288.
- Ward RJ, Kühn LC, Kaldy P, Florence A, Peters TJ, Crichton RR (1994) Control of cellular iron homeostasis by iron-responsive elements in vivo. *Eur J Biochem*. 220(3):927-931.
- Warthen JD Jr (1979) *Azadirachta indica*: A source of insect feeding inhibitors and growth regulators. US Dept Agric Res Results. ARR-NE-4.
- Warthen JD Jr, Uebel EC, Mills CD Jr (1978) An antifeedant for fall armyworm larvae from neem seeds. US Dept Agric Res Results. ARR-NE-1.
- Warthen JD Jr, Uebel, EC (1981) Effect of azadirachtin on house crickets, *Acheta domesticus*. In: Schmutterer H, Ascher KRS, Rembold H (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss). GTZ, Eschborn, Germany. pp 137-148.
- Wesseling C, Hogstedt C, Fernandez P, Ahlbom A (2001) Time trends of occupational pesticide-related injuries in Costa Rica 1982-1992. *Int J Occup Environ Health*. 7(1):1-6.

- WHO (2001) Organophosphorous pesticides in the environment-Integrated Risk Assessment, Geneva, Switzerland.
- Willis JD, Klingeman WE, Oppert C, Oppert B, Jurat-Fuentes JL (2010) Characterization of cellulolytic activity from digestive fluids of *Dissosteira carolina* (Orthoptera: Acrididae). Comp Biochem Physiol B Biochem Mol Biol. 157(3):267-272.
- Wilps H (1989) The influence of neem seed kernel extracts (NSKE) from the neem tree *Azadirachta indica* on flight activity, food ingestion, reproductive rate and carbohydrate metabolism in the Diptera *Phormia terraenovae* (Diptera, Muscidae). Zool Jahrb Physiol. 93:271-282.
- Ximenes E, Kim, Y, Mosier N, Dien B, Ladisch M (2010) Inhibition of cellulases by phenols. Enzyme Microb Technol. 46(3-4):170-176.
- Yadav IC, Devi NL (2017) Pesticides classification and its impact on human and environment. Environ Sci Eng. 6:140-158.
- Yang ZP, Morrow J, Wu A, Roberts LJ, Dettbarn WD (1996) Diisopropylphosphorofluoridate-induced muscle hyperactivity associated with enhanced lipid peroxidation in vivo. Biochem Pharmacol. 52(2):357-361.
- Yin K, Ma EB, Xue CR, Wu HH, Guo YP, Zhang JZ (2008) Study on insecticidal activities and effect on three kinds of enzymes by 5-aminolevulinic acid on *Oxya chinensis*. Agri Sci China. 7:841-846.
- Ylä-Herttuala S (1999) Oxidized LDL and atherogenesis. Ann N Y Acad Sci. 874(1):134-137.
- Yu BP (1994) Cellular defenses against damage from reactive oxygen species. Physiol Rev. 74(1):139-162.
- Zarkovic N (2003) 4-hydroxynonenal as a bioactive marker of pathophysiological processes. Mol Aspects Med. 24(4-5):281-291.

- Zebitz CPW (1987). Potential of neem seed kernel extracts in mosquito control. In: Schmutterer H, Ascher KRS (eds) Natural pesticides from the neem tree (*Azadirachta indica* A. Juss) and other tropical plants. Proc 3rd Int Neem Conf. Nairobi, Kenya, GTZ, Eschborn, Germany. pp 555-573.
- Zerbetto E, Vergani L, Dabbeni-Sala F (1997) Quantification of muscle mitochondrial oxidative phosphorylation enzymes via histochemical staining of blue native polyacrylamide gels. Electrophoresis. 18(11):2059-2064.
- Zhang J, Liu H, Sun Z, Xie J, Zhong G, Yi X. (2017) Azadirachtin induced apoptosis in the prothoracic gland in *Bombyx mori* and a pronounced Ca²⁺ release effect in Sf9 cells. Int J Biol Sci. 13(12):1532-1539.
- Zhang J, Shen H, Wang X, Wu J, Xue Y (2004) Effects of chronic exposure of 2,4-dichlorophenol on the antioxidant system in liver of freshwater fish *Carassius auratus*. Chemosphere. 55(2):167-174.
- Zhao T, Lai D, Zhou Y, Xu H, Zhang Z, Kuang S, Shao X (2019) Azadirachtin A inhibits the growth and development of *Bactrocera dorsalis* larvae by releasing cathepsin in the midgut. Ecotoxicol Environ Saf. 183:109512.
- Zhu J, Xia R, Liu Z, Shen J, Gong X, Hu Y, Chen H, Yu Y, Gao W, Wang C, Wang S-L (2020) Fenvalerate triggers Parkinson-like symptom during zebrafish development through initiation of autophagy and p38 MAPK/mTOR signaling pathway. Chemosphere. 243:125336.