



CYPERMETHRIN

Hazard to Children

acute poisoning
potential developmental effects
immunotoxic
endocrine disruptor
later in life breast cancer
male reproductive problems
Parkinson's disease

Residues in humans

in cord blood, newborn's
meconium, breast milk, house
dust, food, drinking water.^{3 4}

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June 2014
Updated Aug 2025

Uses

synthetic pyrethroid insecticide

Countries banned in

Egypt¹, Advocate General recommended
the Court of Justice to annul the judgment of
the General Court's reapproval of use in
European Union²

Related substances:

alpha - banned in 29 countries
beta - banned in 32 countries
theta - banned in 30 countries
zeta - banned in 30 countries

Acute Toxicity

moderately toxic, neurotoxin

Symptoms: dizziness, nausea, headaches, burning
skin, tingling, fatigue, anorexia, muscle twitching,
seizures, coma. Aspiration pneumonia, acute
respiratory failure, diarrhea, acute kidney
injury & multiple organ failure.⁵

Asthma symptoms in susceptible people.⁶

Death from contaminated food has occurred.⁷

Children have been poisoned in Nicaragua⁸ and Mexico⁹

Common cause of poisoning of farmers in Tanzania.¹⁰

Chronic Toxicity

most frequent child chronic pesticide exposure in UK¹¹
Chronic exposure causes dysregulation of energy metabolism in mice.¹²

Neurological

behavioural effects, delayed mental development^{13 14}
altered dopamine activity in brain (mice)¹⁵
implicated in Parkinson's disease^{16 17}
Potential neurodegeneration in the hippocampus, leading to cognitive dysfunctions (rats)¹⁸

Cancer

US EPA possible human carcinogen, based on tumours in rodents. "Complete carcinogenic as well as tumour initiating and promoting potential" in studies on mice;¹⁹ breast cancer risk.²⁰

Genotoxicity

genotoxic in human cells²¹

Endocrine Disruption

oestrogenic causing breast cancer cells to grow^{22 23}
disrupts testosterone production (mice)^{24 25}
antiprogestagenic (cow)²⁶

Reproduction

significant adverse effects on male rodent reproductive system, reduces sperm production and motility; abnormal sperm (rabbits)^{27 28}

Immune

suppresses immune system²⁹

Environmental Effects

Aquatic: highly toxic to fish, algae, aquatic invertebrates;³⁰ fish kills in US.³¹

Terrestrial: highly toxic to bees,³² beneficial insects, earthworms.³³ Secondary poisoning of birds from insects.³⁴

Environmental Fate³⁵

Severe marine pollutant
groundwater and surface pollutant
Persistent in soil
Potential for bioaccumulation

Notes

- 1 PAN International. 2024. Consolidated list of banned pesticides. <https://paninternational.org/paninternational-consolidated-list-ofbanned-pesticides/>
- 2 PAN Europe. 2024, July 3. Advocate General slams Commission's handling of cypermethrin case. PAN Europe. <https://www.paneurope.info/blog/advocategeneral-slamscommission%E2%80%99shandling-cypermethrin-case>
- 3 Watts MA. 2013. Poisoning Our Future: Children and Pesticides. Pesticide Action Network Asia & the Pacific, Penang.
- 4 UNEP. 2012. Fact sheets on chemical alternatives to endosulfan and DDT. Persistent Organic Pollutants Review Committee. UNEP/POPS/PO-PRC.8/INF/13.
- 5 Liang, C.A., Chang, S.S., Chen, H.Y., Tsai, K.F., Lee, W.C., Wang, I.K., Chen, C.Y., Liu, S.H., Weng, C.H., Huang, W.H., Hsu, C.W., & Yen, T.H. 2023. Human Poisoning with Methomyl and Cypermethrin Pesticide Mixture. *Toxics*, 11(4), 372.
- 6 US EPA. 2008. Reregistration Eligibility Decision for Cypermethrin (revised 01/14/08).
- 7 Poulos L. 1982. Acute intoxication with cypermethrin (NRDC 149). *J Toxicol Clin Toxicol* 19(5):519-20.
- 8 Watts MA. 2013. Poisoning Our Future: Children and Pesticides. Pesticide Action Network Asia & the Pacific, Penang.
- 9 Martínez-Navarrete J, Loria-Castellanos J, Nava-Ocampo AA. 2008. Accidental poisoning with "Chinese chalk". *Acta Biomed* 79(1):36-8.
- 10 Lekei E, Ngowi AV, London L. 2014. Farmers' knowledge, practices and injuries associated with pesticide exposure in rural farming villages in Tanzania. *BMC Public Health* 14:389.
- 11 Perry L, Adams RD, Bennett AR, Lupton DJ, Jackson G, Good AM, Thomas SH, Vale JA, Thompson JP, Bateman DN, Eddleston M. 2014. National toxicovigilance for pesticide exposures resulting in health care contact – An example from the UK's National Poisons Information Service. *Clin Toxicol* [Epub April 16].
- 12 Jin Y, Lin X, Miao W, Wu T, Shen H, Chen S, Li Y, Pan Q, Fu Z. 2014. Chronic exposure of mice to environmental endocrinedisrupting chemicals disturbs their energy metabolism. *Toxicol Lett* 225(3):392-400.
- 13 Oulhote Y, Bouchard MF. 2013. Urinary metabolites of organophosphate and pyrethroid pesticides and behavioral problems in Canadian children. *Environ Health Perspect* 121(11-12):1378-84.
- 14 Xue Z, Li X, Su Q, Xu L, Zhang P, Kong Z, Xu J, Teng J. 2013. Effect of synthetic pyrethroid pesticide exposure during pregnancy on the growth and development of infants. *Asia Pac J Public Health*. 25(4 Suppl):72S9S.
- 15 Nasuti C, Gabbianelli R, Falconi ML, Di Stefano A, Sozio P, Cantalamessa F. 2007. Dopaminergic system modulation, behavioral changes, and oxidative stress after neonatal administration of pyrethroids. *Toxicology* 229(3):194-205.
- 16 Singh AK, Tiwari MN, Prakash O, Singh MP. 2012. A current review of cypermethrin-induced neurotoxicity and nigrostriatal dopaminergic neurodegeneration. *Curr Neuropharmacol* 10(1):64- 71.
- 17 Shukla Y, Yadav A, Arora A. 2002. Carcinogenic and cocarcinogenic potential of cypermethrin on mouse skin. *Cancer Lett* 182(1):33-41.
- 18 ibid
- 19 Watts MA. 2007. Pesticides & Breast Cancer: A Wakeup Call. Pesticide Action Network Asia & the Pacific, Penang.
- 20 Yadav, A., Tandon, A., Seth, B., Goyal, S., Singh, S.J., Tiwari, S.K., Agarwal, S., Nair, S. & Chaturvedi, R.K., 2021. Cypermethrin impairs hippocampal neurogenesis and cognitive functions by altering neural fate decisions in the rat brain. *Mol Neurobiol*, 58(1), 263-280.
- 21 Undeger U, Basaran N. 2005. Effects of pesticides on human peripheral lymphocytes in vitro: induction of DNA damage. *Arch Toxicol* 79(3):169-76.
- 22 Kocaman AY, Topaktaş M. 2009. The in vitro genotoxic effects of a commercial formulation of alpha-cypermethrin in human peripheral blood lymphocytes. *Environ Mol Mutagen* 50(1):27-36.
- 23 Chen H, Xiao J, Hu G, Zhou J, Xiao H, Wang X. 2002. Estrogenicity of organophosphorus and pyrethroid pesticides. *J Toxicol Environ Health A* 65(19):1419-35.
- 24 Jin Y, Wang L, Ruan M, Liu J, Yang Y, Zhou C, Xu B, Fu Z. 2011. Cypermethrin exposure during puberty induces oxidative stress and endocrine disruption in male mice. *Chemosphere* 84(1):124-130.
- 25 Wang H, Wang Q, Zhao XF, Liu P, Meng XH, Yu T, Ji YL, Zhang H, Zhang C, Zhang Y, Xu DX. 2010. Cypermethrin exposure during puberty disrupts testosterone synthesis via downregulating STAR in mouse testes. *Arch Toxicol* 84(1):53-61.
- 26 Gill SA, Rizvi F, Khan MZ, Khan A. 2011. Toxic effects of cypermethrin and methamidophos on bovine corpus luteal cells and progesterone production. *Exp Toxicol Pathol* 63(1-2):131-5.
- 27 Liu L, Hu JX, Wang H, Chen BJ, He Z, Xu LC. 2010 Effects of beta-cypermethrin on male rat reproductive system. *Environ Toxicol Pharmacol* 30(3):251-6.
- 28 Yuan C, Wang C, Gao SQ, Kong TT, Chen L, Li XF, Song L, Wang YB. 2010. Effects of permethrin, cypermethrin and 3-phenoxybenzoic acid on rat sperm motility in vitro evaluated with computer-assisted sperm analysis. *Toxicol In Vitro* 24(2):382-6.
- 29 Ahmad L, Khan A, Khan MZ, Hussain I, Mahmood F, Sleemi MK, Lodhi LA, Abdullah I. 2012. Toxicopathological effects of cypermethrin upon male reproductive system in rabbits. *Pestic Biochem Physiol* 103:194-201.
- 30 IUPAC FOOTPRINT Pesticide Properties Database. <http://sitem.herts.ac.uk/aeru/iupac/index.htm>
- 31 See endnote 4
- 32 See endnote 4
- 33 See endnote 6
- 34 See endnote 6
- 35 See endnote 4