



## Referenzen OEKOSKOP 4/15

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Mangelhafte Risikobewertung der Zulassungsbehörden

# Chemikalien: Menge und Zeit machen das Gift

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Bei der Zulassung von chemischen Substanzen muss das <Paracelsus-Zeitalter> zu Ende gehen. Die Risikobewertung von Chemikalien ist dringend und umfassend zu revidieren.

## Referenzen

- [1] Druckrey, H., Kupfmüller, K. (1949). Dosis und Wirkung. Beiträge zur theoretischen Pharmakologie. Editio Cantor GmbH, Freiburg im Breisgau.
- [2] Haber, F. (1924). Zur Geschichte des Gaskrieges. In Fünf Vorträge aus den Jahren 1920–1923, pp. 76-92. Julius Springer, Berlin
- [3] Druckrey, H., Schildbach, A., Schmaehl, D., Preussmann, R., Ivankovic, S. (1963). Quantitative Analysis of the Carcinogenic Effect of Diethylnitrosamine. *Arzneimittelforschung* 13, 841–51
- [4] Druckrey, H., Dischler, W. (1963). Dosis-Wirkungsbeziehungen bei der Krebserzeugung durch 4-dimethylaminostilben bei Ratten. *Z Krebsforsch* 65, 272
- [5] Magee, P. N., Farber, E. (1962). Toxic liver injury and carcinogenesis. Methylation of rat-liver nucleic acids by dimethylnitrosamine in vivo. *Biochem J* 83, 114–24
- [6] Sánchez-Bayo, F. (2009). From simple toxicological models to prediction of toxic effects in time. *Ecotoxicology* 18, 343–354

- [7] Tennekes, H. A. (2010a). The significance of the Druckrey-Küpfmüller equation for risk assessment - The toxicity of neonicotinoid insecticides to arthropods is reinforced by exposure time. *Toxicology* 276:1–4.
- [8] Tennekes, H. A., Sánchez-Bayo, F. (2013). The molecular basis of simple relationships between exposure concentration and toxic effects with time. *Toxicology* 309:39–51.
- [9] Tennekes, H.A. (2010b). The Systemic Insecticides: A Disaster in the Making, ETS Nederland BV, Zutphen. <http://www.disasterinthemaking.com/>.
- [10] Van Dijk, T. C., Van Staalduinen, M. A., Van der Sluijs, J. P. (2013). Macro-Invertebrate Decline in Surface Water Polluted with Imidacloprid. *PLoS ONE* 8(5): e62374. doi:10.1371/journal.pone.0062374
- [11] Hallmann C.A., Foppen, R.P.B., van Turnhout, C. A. M., de Kroon, H., Jongejans, E. (2014). Declines in insectivorous birds are associated with high neonicotinoid concentrations. *Nature* 511:341–3.
- [12] Bouchard, M.F., Chevrier, J., Harley, K.G. , Kogut, K. et al. (2011). Prenatal Exposure to Organophosphate Pesticides and IQ in 7-Year-Old Children *Environ Health Perspect.* 119(8): 1189–1195
- [13] Rauh, V., Arunajadai, S., Horton, M., Perera, F. et al. (2011). Seven-Year Neurodevelopmental Scores and Prenatal Exposure to Chlorpyrifos, a Common Agricultural Pesticide. *Environ Health Perspect.* 119(8): 1196–1201
- [14] Engel, S. M., Wetmur, J., Chen, J., Zhu, C. et al. (2011). Prenatal Exposure to Organophosphates, Paraoxonase 1, and Cognitive Development in Childhood. *Environ Health Perspect.* 119(8): 1182–1188
- [15] Rauh, V.A., Garfinkel, R., Perera, F.P., Andrews, H.F., Hoepner, L., Barr, D.B., Whitehead, R., Tang, D., Whyatt, R.W. (2006). Impact of Prenatal Chlorpyrifos Exposure on Neurodevelopment in the First 3 Years of Life Among Inner-City Children. *Pediatrics* 118, 1845–1859
- [16] Lacasana, M., Lopez-Flores, I., Rodriguez-Barranco, M., Aguilar-Garduno, C., Blanco-Munoz, J., Perez-Mendez, O. et al. (2010). Association between organophosphate pesticides exposure and thyroid hormones in floriculture workers. *Toxicology and Applied Pharmacology* 243: 19–26.
- [17] Toft, G., Hagmar, L., Giwercman, A. and Bonde, J.P. (2004). Epidemiological evidence on reproductive effects of persistent organochlorines in humans. *Reproductive Toxicology* 19: 5–26.

- [18] Du, G., Shen, O., Sun, H., Fei, J., Lu, C., Song L, et al. (2010). Assessing hormone receptor activities of pyrethroid insecticides and their metabolites in reporter gene assays. *Toxicological Sciences* 116(1): 58–66.
- [19] Meeker, J.D., Barr, D.B. and Hauser, R. (2009). Pyrethroid insecticide metabolites reassociated with serum hormone levels in adult men. *Reproductive Toxicology* 27: 155–160.
- [20] Sekeroglu V, Atli Sekeroglu Z and Demirhañ, E.S. (2014). Effects of commercial formulations of deltamethrin and/or thiacloprid on thyroid hormone levels in rat serum. *Toxicology and Industrial Health* 2014, Vol. 30(1) 40–46
- [21] Vandenberg, L.N., Colborn, T., Hayes, T.B., Heindel, J.J., Jacobs, D.R. Jr., Lee D.H., Shioda, T., Soto, A.M., vom Saal F.S., Welshons, R.V., Zoeller, R.Th. and Myers J. P. (2012). Hormones and endocrine-disrupting chemicals: Low-dose effects and nonmonotonic dose responses. *Endocr Rev* 33: 378–455.
- [22] Endocrine Society (2015). Society Submits Comments to European Commission on Identifying and Assessing EDCs; Statement der «Endocrine Society» vom 29. Januar 2015 – on-line (17/09/2015): <http://www.endocrine.org/membership/email-newsletters/endocrine-insider/2015/january-29-2015/society-submits-comments-to-european-commission-on-identifying-and-assessing-edcs>
- [23] Latham, J. (2014). EU Safety Institutions Caught Plotting an Industry «escape route» Around Looming Pesticide Ban. *Independent Science News*, May 26, 2014 – on-line (17/09/2015): <http://www.independentsciencenews.org/news/eu-safety-institutions-caught-plotting-an-industry-escape-route-around-looming-pesticide-ban/>
- [24] Neslen, A. (2015). «Suppressed» EU report could have banned pesticides worth billions. *The Guardian*, February 2, 2015 – on-line (17/09/2015): <http://www.theguardian.com/environment/2015/feb/02/suppressed-eu-report-could-have-banned-pesticides-worth-billions>
- [25] Neslen, A. (2015). Health costs of hormone disrupting chemicals over €150bn a year in Europe, says study. *The Guardian*, May 6, 2015 – on-line (17/09/2015): <http://www.theguardian.com/environment/2015/mar/06/health-costs-hormone-disrupting-chemicals-150bn-a-year-europe-says-study>
- [26] Hamlyn, O. (2015). Sustainability and the Failure of Ambition in European Pesticides Regulation. *J Environmental Law* (2015) doi: 10.1093/jel/eqv021