
***Glyphosate is a carcinogen –
authorities ignore the evidence***

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Charting the Glyphosate Territory

1. Why important - whether a carcinogen?
2. How risks and hazards are assessed
3. What evidence for carcinogenicity?
4. Authorities twisting the evidence

Carcinogen - Why important ?

Tumour = “Irreversible“ damage

(Legislation in Europe: hazard-based approach → ban if recognised as carcinogen, mutagen or teratogen)

Glyphosate:

known carcinogen + huge amounts released



Ban was/is due in European Union → consequences for import of agric. products

Worldwide > 800.000 t/year → powerful health impact

→ strong economic interest

Assessment of pesticides/glyphosate

- Hazard versus Risk
- Legislation in European Union: hazard-based approach for **carcinogenicity**, mutagenicity, reproductive toxicity

Three Elements for carcinogenicity assessment

1. „Regulatory studies“ (standard design). 1 study in rats, 1 in mice; duration 18-24 months required
2. *If available*: Scientific publications (mechanistic evidence)
3. *If available*: Epidemiological studies

Sufficient evidence: “tumours in at least 2 independent studies“

- Weight of Evidence: accounting for biological variability (valid approach, if honest) → room for manipulation
- Precautionary Principle: required, but almost never applied:

What evidence? (original assessmt.)

Authorities as of 03/2015: „no carcinogenic hazard“

Studies in mice	Malignant Lymphoma	Renal tumors	Haemangio-sarcoma
1983	-	-	-
1993	-	-	-
1997	-	-	-
2001	+	-	-
2009	-	-	-

What evidence? (**re-assessment**)

Authorities as of 08/2015: „no carcinogenic hazard“

Study	Malignant Lymphoma	Renal carcinoma	Haemangio-sarcoma
1983	-	+	-
1993	-	-	+
1997	+	+	+
2001	-	+	-
2009	+	-	-

What (additional) evidence? (1)

Two **mechanisms** identified, how tumours are caused by glyphosate (**oxidative stress, genetic toxicity**)

Oxidative stress:

Some highly reactive oxygen molecules

- regularly formed in our body (metabolism of food)
- inactivated by specialised enzymes
- „stress“, when inactivation systems are overwhelmed by additional chemicals, e.g. glyphosate.

What (additional) evidence? (2)

Epidemiological studies show higher risk for tumours of the lymphatic system (**Non-Hodgkin lymphoma, myeloma**)

[two independent meta-analyses summarizing existing evidence]

Personal evaluation:

Glyphosat is a weak carcinogen, but with absolutely „sufficient“ evidence (official term) – IARC calls it „strong“.

Why weak? Epidemiological studies show approx. 50% higher risk (other chemicals 2-3 times higher)

Authorities twisting the evidence

Abuse of “weight of evidence“:

- Claiming the OECD-statistical approach: not relevant
- Academic studies (mechanistic evidence): not relevant
- Epidemiological studies: not relevant (because considering formulated products, not active ingredient)

Blunt violation of own guidelines / guidance documents:

- Claiming too high doses
- Using wrong statistical approach
- Abusing Historical Control Data

Self-reference (“emperors new clothes“-approach):

“all other authorities came to the same conclusion“

Conclusions

- Unite struggles to ban glyphosate (carcinogenicity is just one reason, also providing an important argument)
- Glyphosate is not the only pesticide (struggle important, but at the same time symbolic)
- True solution:
 - another system of agriculture (agroecology)
and society (solidarity)