Decay takes a holiday: the wickedness beneath the "Chernobyl wild paradise" myth and the rotten implications for ecosystems and radiation science

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admin

Zombie forest?

April 26, 2014 will mark 28 years since the **Chernobyl nuclear reactor exploded** causing an unprecedented nuclear catastrophe. In a creepy revelation, the forests around Chernobyl are having difficulty decomposing. A **recently published study** indicates that forest matter in the contaminated areas around Chernobyl is taking years or even decades longer to decay than it should. In the areas with low radiation, 70 to 90 percent of the leaves were gone after a year. Where radiation levels were higher, "leaves retained around 60 percent of their original weight..."(***Smithsonian.com***) This indicates a fundamental disruption to the natural cycle of death feeding life, and calls into question the forest's longer-term viability. Creatures responsible for decay such as microbes, fungi and some types of insects, are essential components of any ecosystem because they recycle organic material back into the soil. Unfortunately, they do not function properly in the areas around Chernobyl, leaving a forest full of "petrified-looking pine trees that no longer seem capable of rotting." **GIZMODO**

Radiation's effect on decay processes should be expected, considering how it impacts **microbes in food**; or considering the results of a bizarre, cavalier and extremely ill-advised **series of experiments** performed using a "naked reactor" in the late 1950's and early 1960's. These experiments intentionally irradiated a number of varying materials and forest land 40 miles north of Atlanta, GA. Apparently, wood **subjected** to this radiation was produced in small-scale and called "Lockwood", for Lockheed Aircraft Corporation who operated the Georgia Nuclear Laboratory. The building and land is still contaminated with radionuclides.

The lack of decomposer activity has researchers worried that nutrients which trees require for growth are not being recycled, causing trees in the area to grow more slowly. Improper plant decay has potential implications for animal decay as well, although there do not appear to be any Chernobyl studies investigating this yet.

Stalked by Forest Fires

This lack of rotting is also causing the forest litter to pile up and become a fire hazard. Fire could not only destroy the forests further, but can spread the current radioactive contamination to other, potentially uncontaminated areas. "A devastating **radioactive smoke cloud**" could be carried large distances past Ukraine and right across Europe

(again), putting people and farmland at further risk. Each year, Chernobyl firefighters manage up to 80 forest fires, sometimes experiencing metallic “taste” and a tingling of their skin that indicates exposure to higher radiation levels.

One fire in 1992 spread unchecked and destroyed a large area of contaminated forest. Scientists are still studying the effects of that fire and hope to use this data to pinpoint stands of vulnerable pines and other forest areas that should be cleared to lessen potential fire risk. Ukraine does not have the money to clear all contaminated forest vegetation. The lingering threat of forest fires and the inability to rot proves the Chernobyl nuclear disaster is anything but over even though the reactor leaks have long since stopped.

The research team that conducted the decay study and a number of other wildlife studies around Chernobyl, is collaborating with investigators in Japan to determine if improper decay is occurring in areas contaminated with Fukushima radiation.

Scientific fantasy versus ugly reality

As if plant matter’s inability to decompose isn’t unsettling enough, a study published in 2013 indicates that controlled experiments designed to examine the impact of radiation dose and dose rates on biological organisms may underestimate the impact by 8 to 10 times. This indicates that organisms in their natural environment are more sensitive to radiation. Perhaps this dichotomy between what happens in a controlled environment and what occurs in nature is in part due to a growing radiosensitivity among the forest’s inhabitants.

Studies examining Chernobyl animal populations living in chronic low-dose radiation (summarized by Goncharova in 1998) show an increase in radiosensitivity among those whose ancestors were exposed. This indicates that successive generations could be less able to cope with the same degree of exposure as their parents were and that, for certain animal species, there is no genetic adaptation to mutations from low-dose, chronic, man-made radiation exposure—the kind received from nuclear power whether or not there is an accident.

Importantly, a growing radiosensitivity among the individuals of a population over generations would mean that research used to predict radiation damage, if based on data from earlier generations, would not be reflective of damage to the current generation. Likewise, research used for long-term radiation exposure protection that relies on controlled experiments could be extremely unprotective. These two scenarios call into serious question our current radiation protection systems.


Fallen trees in Chernobyl's infamous red forest. (Photo: T.A.Mousseau & A.P. Møller)Actual in-the-field examinations of regions contaminated by

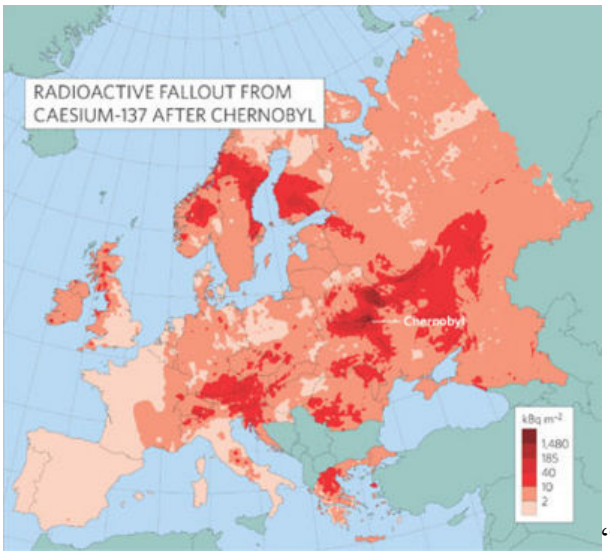
radioactivity from Chernobyl also reveal evidence for **increased mutation rates**, abnormal sperm with reduced swimming ability, developmental abnormalities, **cataracts**, **tumors**, smaller brains in both **birds** and mammals, and **decreased tree growth rates**, a finding of fundamental importance for ecosystem functioning that likely relates to effects on the microbial community. Fewer spiders and insects including bees, butterflies and grasshoppers—**live there**. Animals and plants **show other impacts** of radiation after the Three Mile Island nuclear disaster in the US and the Fukushima nuclear disaster in Japan.

Timothy Mousseau, a biologist at the University of South Carolina, Columbia, who collaborated on many of these studies, contends that, fundamentally, this evidence indicates low-dose rate exposures cause significant measurable impacts for the biota inhabiting contaminated regions of Chernobyl. Further, this evidence supports a hypothesis that suggests effects down to very low levels. Further implications for Fukushima should not be ignored.

Humans and animals alike: healthy looking on the outside, disintegrating on the inside

Referencing studies summarized in his book, *Chernobyl: Consequences of the Catastrophe for People and the Environment*, Alexey Yablokov states:

"Wildlife in the heavily contaminated Chernobyl zone sometimes appears to flourish, but the appearance is deceptive," **says Yablokov**. "Levels of incorporated radionuclides remain dangerously high for mammals, birds, amphibians, and fish. Long-term observations of both wild and experimental animal populations in the heavily contaminated areas show significant increases in morbidity and mortality that bear a striking resemblance to changes in the health of humans – increased occurrence of tumours and immunodeficiencies, decreased life expectancy, early aging, changes in blood and the circulatory system, malformations, and other factors that compromise health.



"All of the populations of plants, fishes, amphibians and mammals studied there are in poor condition," he continues. "This zone is analogous to a 'black hole', in which there is accelerated genetic degeneration of large animals – some species may only persist there via immigration from uncontaminated areas. The Chernobyl zone is a micro-evolutionary 'boiler', where gene pools of living creatures are actively transforming, with unpredictable consequences. We ignore these findings at our peril."

Dr. Yablokov's statement deftly presents the dichotomy between what is observed by a dilettante's eye – such as lots of members in a wild animal population -- versus what is actually happening to

these members over time. What is happening to this wildlife has parallel implications for human health.

So where did this "paradise for wildlife" and "biodiversity sanctuary" myth come from? In 2006 the International Atomic Energy Agency, a nuclear power promoter and a member body of the United Nations, released a report entitled ***Environmental Consequences of the Chernobyl Accident and their Remediation: Twenty Years of Experience***. This report references the creation of a nature preserve within the Chernobyl Exclusion Zone and remarks "Without a permanent residence of humans for 20 years, the ecosystems around the Chernobyl site are now flourishing. The CEZ has become a wildlife sanctuary…, and it looks like the nature park it has become." From another report, quoted in ***Wired*** but no longer available from the IAEA: "...the Exclusion Zone has paradoxically become a unique sanctuary for biodiversity."

The Chernobyl Forum coalition makes this statement in support of "unique biodiversity" in spite of their recognition that "Genetic effects of radiation, in both somatic and germ cells, have been observed in plants and animals of the Exclusion Zone during the first few years after the Chernobyl accident. Both in the Exclusion Zone, and beyond, different cytogenetic anomalies attributable to radiation continue to be reported from experimental studies performed on plants and animals." They conclude, however, "[w]hether the observed cytogenetic anomalies in somatic cells have any detrimental biological significance is not known." In order to know this, one has to actually look.

The study summaries compiled by Alexey Yablokov, et al. (studies which had been mostly unavailable in the west until 2009) and the published examinations of researchers Mousseau, et al., indicate rather strongly that there is *significant biological detriment* to wildlife in the contaminated areas surrounding Chernobyl. And unlike these studies, the Chernobyl Forum documents provide very few references (under ten total) for any claims they make regarding the flourishing of wildlife.
