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BIOGRAPHY Marcelo Firpo Porto

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Member of ABRASCO – Brazilian Association of Collective Health, working in the Health and Environment Thematic Group.

He has experience in the field of Collective Health, with special focus on Environmental Health, currently working on the following issues: political ecology; environmental justice; social vulnerability; complexity, risks and uncertainties; precautionary principle; emancipatory health promotion; impacts of agribusiness and pesticides use; health promotion at slums.

He lectures at the Post-Graduation programme of Public Health at ENSP/FIOCRUZ. He is the author, among other titles, of the books “A political ecology of risks” and “Environmental Justice and Health in Brazil: the Map of Conflicts”.

Monsanto Tribunal - Resume of Testimony

Our testimony comes mostly from the experience of ABRASCO, the Brazilian Association of Collective Health, as well as Oswaldo Cruz Foundation and other academic institutions committed to health and the fight against social inequities. ABRASCO is a scientific entity, non-governmental and of public utility. Its mission is to support individuals and institutions involved in undergraduate and graduate studies, research, cooperation and delivery of services in Collective Health, for the purpose of increasing professional qualification in facing the health problems of the Brazilian population. Since its foundation ABRASCO has been active in the political redemocratization in Brazil and Latin America.

The emergence and use of Collective Health – instead Public Health - is a Latin American, especially Brazilian phenomenon, connected with the struggle for democracy and with the Health Reform movement influenced by preventive, community, and social medicines in its constitution. In the last three decades our field is developing interdisciplinary approaches under the influence of critical social sciences.

We understand health in the context of the social determination theory, democracy and human rights. It means that social, environmental, and health inequalities are linked, produced and confronted in a context of contradictions, conflicts, and conquests, including struggles against labour exploitation, racism, and racial, ethnic, and gender discrimination.

For example, in 1988, at the end of a period of military dictatorship, the new Federal Constitution recognised health as a right of all and a duty of the State, guaranteeing social and economic policies aimed at disease risk reduction and other forms of damage to health. This and other conquests were supported by the Collective Health, the so-called sanitarian movement, ABRASCO and other organizations.

The new Constitution also promised universal and egalitarian access to services for the promotion, protection and recuperation of health. It was the basis of the Sistema Único de Saúde (SUS), the Unified Health System, which is public, universal, decentralised and controlled by the public. But basic rights promised by the Constitution have never been fully guaranteed for all Brazilians, so the fights for social rights continue until nowadays. Even under the government of PT (Workers´ Party) contradictions have continued. Unfortunately, the political situation has been deteriorating rapidly in the last months with the impeachment of president Dilma Roussef and the new, conservative and iletigimate government. Several social conquests are now at risk.

ABRASCO's activities are coordinated by its Board and based on thematic issues, 16 Thematic Groups deal with the relation with science, the State and the society. The Health and Environment Thematic Group is one of them, and we are highly engaged with environmental health problems. Our Group works together with different social movements with interdisciplinary and participative approaches, and in the last years intensively with rural social movements such as the Landless Workers´ Movement (MST) and Via Campesina.

One important task of our Group in ABRASCO is to investigate and disseminate information about the impacts of pesticide use. And the reason is clear: since 2008 Brazil has become the most important consumer of pesticides or agrotoxics (as used by the Brazilian legislation) in the world.

In order to face this problem in 2011 it was launched the Permanent Campaign and For Life, an alliance of social movements and civil society organizations. Currently the Campaign brings together more than one hundred social organizations, and has been developing communications, training, and political connection actions, disclosing the problem and expanding the discussions; such was the intention, for instance, of the production and dissemination of videos like Silvio Tendler's *O Veneno Está na Mesa I and II* (The Poison is at the Table I and II)[1].

Since the beginning ABRASCO and many universities and research centres are supporting the Permanent Campaign Against Pesticides. Our most important work is the "**Abrasco Dossier – An alert on the impacts of Agrochemicals on Health**", published as a book in 2015 and also available in internet in Portuguese free of charge (http://abrasco.org.br/dossieagrotoxicos), and recently also in Spanish (http://abrasco.org.br/dossieragrotoxicos/). The set of texts are organized in four chapters with more than 600 pages that were written by scientists, health professional and activists from various disciplines of all regions from Brazil. They provided scientific basis and empirical data to understand the gravity of health impacts related to pesticide exposure. Our testimony is mainly based on this Dossier.

The Dossier is our most relevant work in order to disseminate scientific and contra hegemonic information about the problem, and it has been used by many social movements, NGOs and citizens who are working in the Campaign Against Agrotoxics. Its importance is also related to the fact that many scientists and institutions are financed by and work together with industries which are important agrotoxic producers. So the Dossier provides another perspective on pesticides.

There is an epistemological and political dispute between two types of science when we discuss environmental and health impacts of pesticides. On the one hand, the dominant science has a regulatory function. Used by the state and international

[1] See https://www.youtube.com/watch?v=3NhcLAkQX6U with subtitles in english.

organizations such as the World Health Organization (WHO), the idea is to define "safety" thresholds often based on studies made by industries or artificial laboratory conditions. Possible problems could be avoided since pesticide users applied correctly the safety rules.

On the other hand, the contra hegemonic, independent, *citizen* and more precautionary science tries to defend life, the environment and health interests of social movements and affected groups fighting against powerful companies and their allied organizations, who are more concerned with profit and economic development. This is our approach. We assume that there is no safe use, and for several reasons. For example, many pesticides are classified as low toxicity, but with time they are often considered dangerous and there is a long process of struggles until they are banned. There is a double standard since in most "periphery" and poorer countries many pesticides continue to be used even after they have been banned in Europe or the US. In 2015, according ABRASCO, 22 of the 50 active ingredients more often used in Brazil were banned in other countries. The situation is even more serious by the fact that many farmers are unable to read or properly understand the safety rules.

There are many examples of these disputes between the two types of Science and scientists around the world, and Brazil is not different. For instance, ABRASCO and engaged scientists have been accused of practicing "junk science" by industries and their allies, and there are cases that industries go to court against researchers.

In the last decades there was a relevant growth in Brazilian agriculture and agribusiness with the expansion of monocultures - mainly grains (soybean and maize), sugarcane, pasture for cattle, and even trees. This is an outcome of the perverse Brazilian insertion in the global agribusiness with the production of rural commodities.

One important consequence of the conservative and industrialised agriculture for export in Brazil is the use of an enormous amount of agrochemicals and agrotoxics. Since 2008, Brazil dominated the position of largest consumer of agrotoxics in the world surpassing US. There was an increase of more than 162% in the volume of pesticides between the years 2000 and 2012. It is estimated that Brazil consumes almost a billion liters (260 million gallons) in the last years, a market of $12,25 billion USD in 2014 with a reduction in 2015 ($ 9,5 billion) due to the economic crisis.

The ever increasing pressure for higher productivity of monocultures after the Green Revolution has received the strong support of the military dictatorship (1964-1985), forcing the continuous expansion of agricultural frontiers, into wild or protected areas, or areas that are occupied by indigenous groups, quilombolas, peasant groups, or family farms. Besides problems associated with ecosystem degradation, agribusiness is an important source of land, social, and environmental conflicts, threats to the survival of traditional ethnic groups and populations, and violence, including innumerous assassinations that are carried out in areas of agribusinness expansion.

Here is the first question against Monsanto and other multinational producers of pesticides: the expansion of this unfair, unsustainable and violent agricultural model depends fundamentally on undemocratic political regimes. Monsanto, together with other multinationals as Syngenta, Bayer, BASF, Dow, and DuPont, forms an oligopoly that concentrates the global supply of pesticides. These companies had been benefited from a strong support received by the military government in Brazil. The Brazilian dictatorship, together with agribusiness companies, implemented the conservative modernization of Brazilian agriculture since 1965. This model was strengthened and updated from 1990 to the present even in the democratic but, at the same time, conservative period under the support of the so called "bancada ruralista", the expressive group of deputies and senators representing the interests of agribusiness in the Federal Congress.

Another question is the role of Monsanto in the spectacular growth of the use of pesticides in Brazil. According to the union of producers of pesticide industries, in 2015 soybean was responsible for consuming 52% of pesticides sold in Brazil. Between 2002 and 2015, soybean acreage increased from 16.4 to 33,1 million hectares, and the herbicide glyphosate was the best-selling pesticide. Mato Grosso is the most important producer of soybeans in Brazil: 26 million tons in about 9 million hectares.

Monsanto had an important role in the adoption in 2005 of the federal law that regulates GMOs in Brazil, also known as Biosafety Law, and many call as the "Monsanto Law". According to Edson Duarte, member and vice leader of the Green Party in the Chamber of Deputies at that time, an important strategy for the adoption of the law was to bring together the transgenic with the stem cell research. Thus the issue of GMOs no longer was discussed and the public debate took place emotionally with the support of disability rights organizations.

One absurd of the governmental support to this chemical dependent model of agriculture is the subsidy given not only to the major producers of agribusiness, but to the chemical industry. Pesticides are considered agricultural inputs such as tractors, and so fail to pay taxes. On the other hand, the social, environmental and health impacts of pesticides are paid by the whole society and public institutions, the so called negative externalities. Studies with empirical data of only acute poisoning in the state of Paraná, south Brazil, has estimated that for each dollar spent to purchase pesticides, approximately US$ 1,3 may be spent with the external costs of poisoning. The register of pesticides in Brazil likewise has much lower costs than in other countries such as USA and in Europe.

Official figures from the Information System of Compulsory Notification Conditions (SINAN) indicate that between 2007 and 2011 there was an increase of 67.4% of new non-fatal labour accidents due to pesticides, and the coefficient of

intoxications had an overall increase of 126.8%, and was even higher among women (178%). Between 1999 and 2009 the number of acute poisoning registered by the National System of Toxic-Pharmacologic Information of FIOCRUZ was about 62 thousand. However, underdiagnoses and under-notification are widely acknowledged for acute cases, with some studies pointing out that real figures may be many times higher. The limitation is even more problematic when it comes to the assessment of chronic effects.

The Brazilian Ministry of Health estimates that more than four hundred thousand people are contaminated by pesticides each year, with about four thousand deaths for both acute and chronic intoxication. Both cases tend to be underestimated or made invisible in the public discussion for several reasons. For instance, many cases of deaths by acute poisoning are suicides, but there is much evidence that pesticides are neurotoxic and induce depression and suicide. Similarly there are much evidence that chronic exposure to pesticides produces cancer. But as its aetiology is complex and multifactorial, many cases of cancer are not associated with pesticide exposure. Currently many rural areas of Brazil, such as in the State of Ceará (northeast), already have more cases of cancer than in urban areas, and a central hypothesis is the intensive use of pesticides.

It could be argued that the use of pesticides in a highly mechanized crop like soybeans were less problematic because of safer control. But cases such as aerial spraying in the municipalities of Lucas do Rio Verde (Mato Grosso) in 2006 and Rio Verde (Goiás) in 2013 are examples of real tragedies affecting people living around the soy plantations. In Lucas do Rio Verde the pesticide spraying by airplane and tractor were held less than ten meters of drinking water sources, streams, stockbreeding, residences and outskirts of town. Studies in the region have found pesticides in drinking water wells and even in rain water and breast milk. In Rio Verde about 100 students and teachers were poisoned and 40 were hospitalized.

Finally we consider that the global agribusiness model is antithetical to the practices of peasant, familiar and agro ecological farming, since these produce food in an environmentally sustainable and socially just manner that respects nature and health, and works together in harmony with biodiversity and natural resources. Among the most urgent actions, the ABRASCO Dossier proposes: prioritizing the implantation of a National Policy of Agroecology replacing the public funding of the farm business and pesticide use; pushing international debates and face the concentration of the world food system; banning agrochemicals that already are prohibited in other countries; reviewing the parameters of potable water in order to limit the accepted chemicals substances and curbing the maximum permitted and prohibiting the aerial spraying of pesticides.

Selected materials additional to the testimony given by Marcelo Firpo Porto of ABRASCO (Brazilian Association of Public Health) to the Monsanto Tribunal.

Book Dossier Agrotoxics (from ABRASCO – Brazilian Association of Collective Health – available in portuguese http://www.abrasco.org.br/dossieagrotoxicos/wp-content/uploads/2013/10/DossieAbrasco_2015_web.pdf)

p. 54 - Consumption of pesticides and fertilizers in crops in Brazil, from 2002 to 2011. This increasing is related mostly by the expansion of transgenic soy plantations in the country and the corresponding increase in the use of glyphosate, which corresponds to ca. 40% of pesticide sales in Brazil.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agrotóxicos (milhões de l)	599,5	643,5	693,0	706,2	687,5	686,4	673,9	725,0	827,8	852,8
Fertilizante (milhões de Kg)	4.910	5.380	6.210	6.550	6.170	6.070	6.240	6.470	6.497	6.743

p. 72 - Contamination with glyphosate in well water used for human consumption in northeastern Brazil.

P. 126 - Surveys using data from the Brazilian National System of Notified Diseases from 1996 to 2000 showed that glyphosate was one of the main pesticides present in cases of acute intoxication.

p. 136- A study published in 2007 on groundwater in the Dourados river basin in the Center-West of Brazil showed that glyphosate was the major source of contamination.

p. 246 – From about 500 Brazilian researchers who published scientific texts between 2007 and 2012 on glyphosate about 83% had focused on agricultural efficacy of glyphosate use, and only 3% had studied specific health and toxicity issues.

P. 422 - The 2005 law that created the National Technical Biosafety Commission (CTNBio) had a strong lobbying by Monsanto in order to be approved. This law is a milestone that facilitated the official introduction of transgenic seeds in Brazil.

Pp. 70-74, 132, 216, 332, 350, 360, 375, 420 - The aerial spraying of pesticides, mainly herbicides such as glyphosate, has produced several tragedies in areas adjacent to grain monocultures such as soybeans, as well as fruit, coffee and eucalyptus plantations. Schools, health units and even indigenous areas have suffered the harmful effects of aerial spraying.

P. 204- Increased incidence of cancer in rural areas of the Northeast Region most likely associated with the intensive use of pesticides

Other relevant articles related to environmental impacts of Glyphosate in Brazil

De Armas et al. Spatial-temporal diagnostic of herbicide occurrence in surface waters and sediments of Corumbataí river and main affluents. Quim. Nova, Vol. 30, No. 5, 1119-1127, 2007. See in:

https://www.researchgate.net/profile/Regina_Teresa_Monteiro/publication/279791655_Spatialtemporal_diagnostic_of_herbicide_occurrence_in_surface_waters_and_sediments_of_Corumbatai_River_and_main_affluents/links/55b2405e08ae092e96503af5.pdf

Resume: Residues of herbicides from sugarcane were monitored in waters and sediments of Corumbataí River and tributaries. Ametryne, atrazine, simazine, hexazinone, glyphosate, and clomazone were detected in water samples, with negligible levels of ametryne and glyphosate in sediment samples. The area of recharge of the Guarani aquifer presented the highest triazine and clomazone levels. The triazines were detected at higher levels, with atrazine above Brazil's potability and quality standards. Total herbicide levels at some sampling points were 13 times higher than the European Community potability limit. There is no Brazilian standard for ametryne, although the risk is larger due to ametryne's higher toxicity for the aquatic biota.

Correia, F. V., & Moreira, J. C. (2010). Effects of glyphosate and 2, 4-D on earthworms (Eisenia foetida) in laboratory tests. Bulletin of environmental contamination and toxicology, 85(3), 264-268. See in: http://link.springer.com/article/10.1007/s00128-010-0089-7

Resume: Laboratory tests were conducted to compare the effects of various concentrations of glyphosate and 2,4-D on earthworms (Eisenia foetida) cultured in Argissol during 56 days of incubation. The effects on earthworm growth, survival, and reproduction rates were verified for different exposure times. Earthworms kept in glyphosate-treated soil were classified as alive in all evaluations, but showed gradual and significant reduction in mean weight (50%) at all test concentrations. For 2,4-D, 100% mortality was observed in soil treated with 500 and 1,000 mg/kg. At 14 days, 30%–40% mortality levels were observed in all other concentrations. No cocoons or juveniles were found in soil treated with either herbicide. Glyphosate and 2,4-D demonstrated severe effects on the development and reproduction of Eisenia foetida in laboratory tests in the range of test concentrations.

VARGAS L. et al. Conyza bonariensis Biotypes Resistant to the Glyphosate in Southern Brazil. Planta Daninha,Viçosa-MG, v.25, n. 3, p. 573-578, 2007. See in: http://www.hrac-br.com.br/wordpress/wp-content/uploads/2014/02/buva-conyza-bonariensis-resistente-ao-glyphosate-na-regiao.pdf

Resume: Horseweed (Conyza bonariensis) is a common weed in Rio Grande do Sul and traditionally sensitive to glyphosate. However, during the last years, some horseweed

plants have not shown significant injury symptoms after treatment with glyphosate, suggesting that they are resistant to this herbicide. Aiming to evaluate the response of a population of horseweed plants to glyphosate, one field and two greenhouse experiments were carried out. The resistant biotype showed low response to glyphosate, even at very high rates, confirming resistance of this horseweed population to glyphosate.