Media leaps on French study claiming GM maize carcinogenicity

A scandal—cried French newspaper *Le nouvel Observateur*—following publication of a paper by Gilles-Eric Séralini from the University of Caen, in France, on a long-term study of the toxicity of GM maize. The study's online publication on September 19 by *Food and Chemical Toxicology* prompted a media frenzy. The study made a bombshell claim, completely unprecedented in the literature: rats fed for two years on Monsanto's NK603 corn expressing 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS), cultivated with or without Roundup, and Roundup alone, develop a range of tumors. The authors claimed that the disruption of biosynthetic pathways that may result from overexpression of *EPSPS* in the GM maize can give rise to pathologies.

REUTERS/Regis Duvignau

French opposition to GMOs seems set to increase.

The study, said to have cost €3 ($3.9) million, was dismissed as scientifically unsound by numerous scientists with or without ties to the agbiotech industry. Both the German Federal Institute for Risk Assessment (BfR) and the European Food Safety Authority (EFSA) lamented inadequate experimental design, poor analysis and data reporting. Writing on behalf of the European Federation of Biotechnology, biotech pioneer Marc Van Montagu comments on the study. "This paper represents a dangerous case of failure of the peer-review system." Van Montagu also lambasts the communication strategy of the authors. The publication was timed to coincide with a book on the experiment and a film to be broadcast on public television and in cinemas. Most unusually, an association representing Séralini offered interested journalists a confidentiality agreement to get early access to the paper that prevented signatories from approaching third-party researchers for comment, with a penalty of several million euros to be levied if the contract were breached. As a consequence, initial media coverage was almost ubiquitously noncritical.

Controversy soon followed when funding ties with several supermarket chains promoting non-GM positions were revealed; Séralini's decision not to provide EFSA with additional unpublished data also did not help. "If the intention was to 'manage' the news, it wasn't managed very well," says Jonathan Amos from the BBC, which did not sign the confidentiality agreement. Despite the paper's flaws, it seems likely that the initial coverage will negatively sway public and political opinion in France, where it seems to have hardened the socialist government's already unfriendly stance toward GM organisms. Before the French Agency for Food, Environmental and Occupational Health & Safety (Anses) could deliver its opinion (expected by the end of October), the agriculture minister Stéphane Le Foll stated that long-term feeding studies should become mandatory for GM food crops, even if Séralini's work is debunked.

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biggest impact is expected in 2014 when GM rice and GM maize biosafety licenses expire. "We are worried that the invalidity of biosafety licenses [for GM rice and maize] will dramatically postpone the commercialization process," says a scientist at Huazhong Agricultural University, who spoke to *Nature Biotechnology* on condition of anonymity.

In India, politics have also become entangled in a radical about-face in GM crop commercialization. India was on the verge of marketing its first GM food—insect-resistant *Bt* brinjal (eggplant). But a political row erupted and *Bt* brinjal approval was placed under an indefinite moratorium. That was 2010 (*Nat. Biotechnol.* **28**, 296, 2010) and since then public opposition to GM foods has grown. On August 9, the Parliamentary Standing Committee on Agriculture published a report urging the government to stop all open-field GM trials and confine all research to greenhouses until the regulatory system is revamped. The report, spearheaded by nongovernmental organizations (NGOs), was written by a panel of 31 members of Parliament after examining, according to the panel, over 1,400 documents and interviewing scientists, civil society representatives and farmer organizations. Leading biochemists such as Govindarajan Padmanabhan at the Indian Institute of Science in Bangalore, who is pro-GM, and scientists from the Department of Biotechnology, Council of Scientific and Industrial Research and Indian Council of Agricultural Research, who also support the technology, were among those interviewed. Pushpa Bhargava, a biologist and founder-director of the Centre for Cellular and Molecular Biology in Hyderabad, who is opposed to GM was also interviewed.

India first embraced GM crops in 2002, allowing companies to produce and market cotton modified with the *Bt* gene using a technology owned by St. Louis–based Monsanto (*Nat. Biotechnol.* **20**, 415, 2002). After a few years, public resistance began to rise, driven by activists and NGOs, culminating with the moratorium on *Bt* brinjal, despite the fact that the crop had been approved for commercialization.

The latest report to the Indian government is damning. The panel unanimously declared "after critically analyzing the evidence for and against" that there are better options available than GM crops for increasing food production. The cultivation of *Bt* cotton, widely regarded as a commercial success, was also dismissed as beneficial to industry and "only added to the miseries" of farmers (*Nature* **487**, 8, 2012).

"The report is a big setback," says Kottaram Narayanan, managing director of Metahelix Life Sciences in Bangalore and an executive of the industry body ABLE (Association of Biotechnology-Led Enterprises). "The narrow thinking of our politicians under the influence of a few NGOs is really jeopardizing the country's progress in agriculture," adds Arvind Kapur an executive of Rasi Seeds, one of the first Indian companies to market *Bt* cotton. Padmanabhan fears the move will "deprive the country of a powerful technology option to cater to the needs of millions of children suffering from malnutrition."

If implemented, the report's recommendations could slow down—and perhaps halt—much transgenic work, not just in private companies, but also in the public sector. In response, on October 9, the prime minister's Scientific Advisory Council, chaired by C.N.R. Rao called for a "judicious blend" of traditional breeding and new technologies.

Until any formal policy decisions are made, it is unclear how damaging the report will be to the dissemination of GM technology in India, says Kottaram. Even before this report came out, the requirement to obtain a 'no objection certificate' from state governments was slowing down GM crop trials.

Despite the prevailing mood, the Department of Biotechnology (DBT), which currently funds research on some 30 GM crops, will maintain its support for the technology. "In fact, only recently [on August 29] we signed a deal with