Bt brinjal: Alliance for Crooked Science & Corporate Lies

Farida Akhter

Introduction

Brinjals, locally called *Begun* (in Bangla) by the people of Bangladesh, are the most common and favourite vegetable. On 17 May, 2020 the New Age, a national daily of Bangladesh published an article of mine [Akhter, 2020] titled "Aubergine Story: Local varieties exists, not GMOs". In the article, I argued that in the month of Ramadan (month long fasting of the Muslim communities), the demand for brinjal (eggplant/aubergine) is the highest, because it is the main component of the most popular *Iftar* item, the *Beguni*. From the rich to the poor, Iftar[1] is incomplete without *chola-peyaju-beguni* on the plate. In the market, local varieties of brinjals were amply seen, but not Bt brinjal, although claimed by the promoters that smallholder farmers have rapidly adopted the crop, from just 20 in 2014 to more than 27,000 in 2019 across all districts of Bangladesh [Conrow, 2019].

The article referred to a UBINIG quick survey over telephone in April-May 2020, with farmers in eight districts and consumers in Dhaka to investigate how farmers were faring during the COVID-19 Lockdown period with the marketing of brinjals. These were sold for prices ranging from Tk 35 to Tk 80 a kilogram on the market. In early May, at least 26 different local varieties with beautiful names, specific to their agro-ecological locations, were found on the market. For example, in Noagaon the varieties are Alta Bulbuli, Lodha Begun, Ghia Begun, Kanai Begun, Shoila Begun, Ramchandrapuri, Jhumka etc.; in Jessore, local varieties such as Makra, Bhangor, Baropata and Kata Begun are found and fetched good price. The price varied according to varieties as each is valued not only by the supply and demand matrix but more for taste and local culinary culture. Shingnath brinjal is sold for prices of Tk 40–50 a kilogram, Chakra, Lafa and Kata begun sell for Tk 50–100 a kilogram. Few HYV varieties known as Jessori and IRRI begun were found in Jessore and Kushtia and two hybrid varieties (China-3 and Ired) were found in Kushtia and Natore. The prices of HYV brinjals were between Tk 25 - 50, and that of hybrid was Tk 45–55 per kilogram. Commercial farmers grow the HYV varieties on a large scale while the small farming households grow local varieties on a smaller scale in their small pieces of land. Interestingly, they are readily available on the market and have a good demand. Local varieties fared much better than the HYV and hybrid varieties.

Jessori Begun

Shoila Begun

Jhumka-Sada

Bt brinjal seeds (Bt brinjal 1, 2, 3 and 4) for the winter season were given to farmers in different areas during the period December 2019 to January, 2020. If the claim of International Food Policy Research Institute (IFPRI) and the ministry of agriculture is true that 27,000 smallholding farmers were cultivating Bt brinjal across all districts of the country, then it is reasonable to expect that the new genetically modified crop would have grown enough in quantity to be visible in the market. The markets in eight districts and in Dhaka showed no presence of any Bt brinjal in late April–early May 2020. None of sellers in the market could identify any Bt brinjal in their stock. None of the buyers interviewed in Dhaka market could identify any aubergine, which would be a GMO.

[1] Iftar (Arabic: إفطار,'break of a fast'), is the evening meal with which Muslims end their daily Ramadan fast at sunset.

Could it be that those were in the market without any label? In that case, it is a clear case of violation of approval conditions of Bt brinjal in the country. We know that in October 2013, the National Committee on Biosafety (NCB) imposed seven conditions to be followed in field cultivation of the four Bt brinjals (1,2,3 & 4) One of these conditions was labeling — if Bt brinjal is brought to the market, it must be labeled, i.e., it should be clearly stated that it is GMO. But the Director General of BARI, Dr. Rafiqul Islam Mondol only agreed to label the sacks as 'poison-free GM brinjal' [Akhter, 2016], which was also not followed.

Source: *Bangladeshe Adhunik projuktir bt beguner jat udbhabon O utpadon projukti*, BARI, USAID, ABSPII & Cornell University, 2014

Culturally, farmers have the tradition of naming the brinjals they grow with beautiful local names such as Hingla begun, Batka begun, Tal-begun, Kalo-khato begun, Laoitta begun, Sailla begun, Ghritakanchan begun, Nayantara and many others. Brinjal (Solanum *melongena L.*), also known as aubergine or eggplant) is one of the most common and important vegetables. It is an important solanaceous crop of sub tropics and tropics. In this rich diversiy of brinjals, Bt brinjal is now a '*bejat*' name in the list of hundreds of diverse varieties of aubergine in the country, because these are numbered like prisoners and are called Bt brinjal 1, 2, 3 and 4. The word '*bejat*' expresses the displacement in the order of crop varieties implicating potential harm to agriculture, food system and culture. In 'bejat', the original names of source materials have disappeared. Local names of brinjals are always related to specific agro-ecological conditions where a variety could express their natural genetic trait. But Bt brinjal seeds are given to different geographical locations, assuming a homogenous agro-ecological environment, where they do not belong, are now hard to decide where they belong except in the gene-manipulating laboratories. Farmers cannot feel or determine any agro-ecological, culinary or cultural connections to laboratory varieties, such as, for growing these brinjals. Therefore, farmers who received the Bt brinjal seeds, and not being told the real name of the introduced Bt brinjal, called genetically engineered varieties as "*Sarkrari Begun*" or the "government brinjal".

The genetically modified Bt brinjal has been developed by inserting a gene *cry1Ac* from a soil bacterium called *Bacillus thuringiensis* through an *Agrobacterium*-mediated gene transfer. Four Bt brinjals are distributed to farmers for field cultivation. The original names of the varieties that had been selected for transgenic manipulation are Uttara (Bt brinjal-1), Kajla (Bt brinjal 2), Nayantara (Bt brinjal 3) and ISD-006 (bt brinjal 4). These are some of the most popular commercial varieties as well and they are also grown as non-Bt varieties. There are elements of deception in Bt brinjal field trial in selecting the most popular varieties; if farmers accept any transgenic variety, it could be claimed that genetic manipulation is a commercial success. But farmers varieties, selected over hundreds of years, are already successful and proof of the brilliance of the farmer's knowledge. Genetic manipulation is merely a trick for appropriation of farmer's knowledge.

Bangladesh has been a target country for the Bt brinjal under the Agricultural Biotechnology Support Project II (ABSP II). The introgressions of Bt gene into 9 Bangladeshi local variety brinjals were done at MAHYCO, (Maharashtra Hybrid Seed Company) the Indian company, using their lab facility. MAHYCO has received the application rights of the Bt cry1Ac gene technology from US company Monsanto which has a 26 per cent stake in Mahyco-Monsanto Biotech (MMB). The Bangladeshi varieties were backcrossed at MAHYCO with transgenic brinjal containing Cry1AC. This means that there was hardly any scope for knowledge and technology transfer from MAHYCO's proprietary technology to the scientists working in public research

institutions of Bangladesh. The Bt brinjal is actually a piracy of the local variety brinjals to be genetically modified for patenting by Monsanto-Mahyco partnership.

Under ABSPII, the three country partnership arrangement was extended to the Indian Institute of Vegetable Research, Varanasi, University of Philippines in Los Banos, a government research institute Bangladesh Agricultural Research Institute (BARI) and a private seed company, East West Seeds, Bangladesh. The ABSP II is funded by USAID and led by Cornell University, USA.

On 25 May, 2020 Frontiers in Bioengineering and Biotechnology published an article based on 2019 study on Bt brinjal claiming that 83.1% of Bt brinjal growers were satisfied with the yields obtained, and 80.6% were satisfied with the quality of fruit, while 58.7% non-Bt brinjal growers were satisfied with their yields and 28% indicated that a large portion of their fruit was infested. Among the non-Bt brinjal growers, 39.6% had not heard of Bt brinjal [Shelton, et. Al 2020]. Another article was published on 28 May, 2020 in the CornellCALS, by Joan Conrow which referred to the same article published on May 25, 2020 in the Frontiers making a conclusive statement that "farmers in Bangladesh achieved significantly higher yields and revenues by growing insect-resistant, genetically engineered eggplant". However, the article quotes Maricelis Acevedo, Director for the Feed the Future South Asia Eggplant Improvement Partnership, "This study provides more evidence that Bt brinjal is being accepted in the market, but more work is needed to develop new varieties better adapted to local conditions and market preferences " [Conrow, 2020]. It looks like they do not have updated information on the Bt brinjal farmers' performances in this year; it was simply a deceptive tactics using previous studies with newer headlines. The question remains, why they are not visible in the market?

Cornell University & Bt brinjal "success" lies

The Cornell Alliance for Science was launched in 2014 with a $5.6 million grant from the Bill and Melinda Gates Foundation to "add a stronger voice for science and depolarize the charged debate around agricultural biotechnology and genetically modified organisms (GMOs)" [CCR, 2015]. Cornell University is home to the controversial Cornell Alliance for Science, which is publicizing the Bangladesh Bt brinjal project. Its partners include the GMO industry group ISAAA, which is funded by Monsanto, CropLife, and Bayer. Cornell gave Mark Lynas a Visiting Fellowship and a platform to voice his pro-GMO views. Lynas now promotes GMOs "to the exclusion of almost everything else". Cornell paid his travel expenses to the Philippines to write a pro-GMO article [GMW, 2015]

The role of Bangladesh Agricultural Research Institute (BARI) from the beginning was guided by the ABSPII project guidelines, and it had to provide its Regional research stations for Field Testing and later on to get formal government approval for commercial cultivation in the farmer's field. Started back in 2005 it took seven years to complete greenhouse trials. The national bio-safety committee approved the contained field trial of Bt. Brinjal in 2007-08 [Ahmed, 2013].

However, the results of the contained field trial were not shared with relevant stakeholders before it was allowed for Open Field Trial. Later, Open-Field Trials of Bt brinjal were conducted in various agro-ecological zones in the country for local adaptability of the crop. From the beginning, the field research was conducted by BARI/USAID/ABSPII and Cornell University. Monsanto hardly appeared in those signboards. All the Signboards were in English. As implementing agency it said: Biotechnology Division, BARI, Gazipur ARS, USAID, ABSP-II & Cornell University [UBINIG, 2013].

There were also Danger signs for GMO field testing!

Danger Signboard on the Research Station Field

This Confined Trial is for research only

Not Approved for Human food or Animal Feed

Entrance is restricted

AUTHORISED PERSONNEL ONLY

But fencing in all the Research stations was hardly strong enough to restrict entrance of the public.

The role of the government was limited to on getting approval from the National Committee on Biosafety (NCB) under Ministry of Environment & Forest (MOEF) as recommended by the National Technical Committee on Crop Biotechnology (NTCCB) under Ministry of Agriculture. The report of the performance of the Field Trials in the BARI research stations was never published nor there is any reference to it. UBINIG investigation in the six regional stations of BARI showed that the trials were not very satisfactory {UBINIG, 2013].

In a notification (in bangla) of October 30, 2013 bearing a reference No.22.00.0000.073.05.003.2012-271 the Environment Section-2 of the Ministry of Environment and Forestry provisionally approved the petition of BARI to cultivate Bt Begun varieties 1,2,3 and 4 in a limited scale at the field level, by with seven conditions. One of the conditions was to take effective measures by the applicant organization for labeling so that Bt Brinjal can be marketed as per Biosafety Rules. The Ministry of Agriculture till now did not take any such measure.

Strategies of Cornell University to promote Bt brinjal

Ronnie Coffman, Director, Cornell University (left), Prime Minister Sheikh Hasina Wazed (middle) and Minister for Agriculture Matia Chowdhury (Right)

Attracting the top leadership of the State- The Prime Minister

In May, 2015, Cornell University Visiting director Ronnie Coffman honored Prime Minister Sheikh Hasina with a citation to the Prime Minister at her office on behalf of the university's president David J Skorton.

The citation signed by the president of the university read: "*Prime Minister Sheikh Hasina's continuous support for the improvement of agriculture sector in Bangladesh and attain self-sufficiency in food production as well as her keen interest in promoting science and technology*."

Ronnie Coffman of the Cornell University informed the Prime Minister that the new variety of the brinjal can withstand pest attacks and hence is free from pesticides. Sheikh Hasina thanked the Cornell University for innovation of the Bt brinjal [NTV, 2015].

Lies & False Claims

Although Bangladesh Agricultural Research Institute (BARI) is the responsible government institution to conduct the research and monitoring of the field cultivation, unfortunately it hardly can provide information on success or failures of Bt brinjal. There is no information in BARI's website (www.bari.gov.bd). The Department of Agricultural Extension (DAE) which is responsible for distributing the Bt brinjal seeds to the targeted farmers, also has no information in their website (www.dae.gov.bd) . They did not have to do any promotion of Bt brinjal, nor had to come up with any performance reports. No report has been published as research findings of the first two rounds of field cultivation except some propaganda campaigns. Even International Service for the Acquisition for Agri-Biotech Applications (ISAAA) did not publish any report after its Brief 47: The Status of Commercialized Bt Brinjal in Bangladesh, in 2014. There is nothing in 2015 which could have reported about the so-called success of the second round field cultivation. In the second round Bt brinjals, seedlings were given to 108 farmers, of which 79 farmers were interviewed and were found to have massive failures [UBINIG, 2015].

For Cornell University, despite having big names of scientists and propaganda journalists like Mark Lynas, it was not very easy to establish the claims of so-called success of Bt brinjal cultivation in Bangladesh. Farmers' organizations like Nayakrishi Andolon, research organizations like UBINIG, environmental activist groups and individual activist journalists always had different reports published before and after approval of Bt brinjal. Field areas including farmers fields were followed up and farmer's experiences of failures were documented. Repeatedly UBINIG and Nayakrishi proved that so called claim of success has no scientific and empirical basis. Till today, the promoters of GMOs failed to produce any scientific evidence that Bt-brinjal field trial was successful, nor they could show farmers have adopted their transgenic varieties. the false claims of successes were challenged.

The International Food Policy Research Institute (IFPRI) also undertook a study under the behest of the Ministry of Agriculture with 1200 farmers in 2018; the report was released in 2019 [Ahmed, 2019].

False Claims on Economic Gains

The IFPRI study finding claimed, 'farmers, who cultivated the GM versions gained by 55 percent higher income comparing to their peers growing the non-Bt brinjal'. Overall, Bt brinjal farmers enjoyed (during study period) a 55 percent hike in revenues, increasing net profit by over Tk. 30,000 per hectare. [IFPRI, 2019]

In Bangladesh the majority of farmers (84%) belong to small households, owning less than a hectare land, only 14% households have over a hectare to 3 hectares [BBS,2014]. Brinjal farmers are mostly small scale farmers and allocate land to brinjal farming which is less than a hectare. Bt Brinjal farmers also fall into this category. In a UBINIG study (2019) 71% of farmers receiving Bt Brinjal seeds were small scale farmers and only 25% farmers were middle farmers. However, they do not allocate all the land they own for brinjal farming and also not to Bt Brinjal farming. In the initial round of Bt brinjal farming (2015-16), 33 farmers (89%) out of 37 allocated land 33 decimal, i.e. less than one-third of an acre for Bt brinjal. The land allocated by the farmer for Bt brinjal cultivation varied by number of seedlings given and therefore it was found that the allocated land was between 4 decimals to 38 decimal. The land was selected and the amount was determined by the DAE official himself [UBINIG, 2019].

UBINIG field investigation showed a farmer cultivating Bt brinjal 2, Bt brinjal 4 in a land of 33 decimals incurred loss of Tk. 30,000, another farmer had a loss of Tk.25,000 [Jony & Sobhan, 2016]. There is hardly any basis of IFPRI's claim.

False Claim: Bt brinjal is Pesticide-free

Bangladesh is a country of wide range of varieties/cultivars of brinjals. Bangladesh has at least 248 indigenous varieties of brinjals. Most of the varieties are resistant to major disease and pests. The major pests of brinjal include insect, mite, fungi, nematode and bacteria. The fruit and shoot borer (Leucinodes orbonalis) is one of the insect pest of brinjal. Some of the local varieties including Jhumka 1, Jhumka 2 are highly resistant to fruit and shoot borer; Islampuri 3, BL 34, Muktakeshi are fairly resistant, Singnath long and Singnath 4 are tolerant to brinjal shoot and fruit borer [Mannan et. al 2003].

Bt brinjal promoters claim that Btbrinjal is pesticide free. It is called "***Poka bihin begun***" (no-pest brinjal) that it does not require use of pesticide for the most common pest called Fruit and Shoot Borer (FSB). Therefore, GM crops are claimed to be safe because it does not need application of huge amount of pesticides. Interestingly, the IFPRI study did not claim about no use of pesticides, but claimed the there was 39 percent reduction in the quantity of pesticides applied and 51 percent reduction in the number of pesticide applications [IFPRI, 2019]. Although the major promotional message to the farmers was Bt brinjal does not any require application of pesticides and not merely reduction in the use of pesticide.

But UBINIG field study found a different reality. The farmers had to use huge amount of pesticides recommended by the supervising authorities of BARI and DAE. These included Comfidor, Ektara, Admasar, Dithen M-45, Bavistin, Thiovit, Basudin, Furadan, Borax, Demsa granular, Vim powder, Admire, 200sl (Bayer crop science), Bleaching powder, Heckel, Salclox, Diazinon etc. There were many other Insecticides and Fungicide sprayed as provided by DAE. In the booklet distributed to some of the farmers, they recommended organic pesticides such as Neem seeds, Neem oil, powder soap, Trix. Among the chemical pesticides Malathion, Omite, Baviston were suggested for different pest/disease attacks. It seems in the real situation the supervising authorities were giving more pesticides than those recommended because of pest attacks of different kinds.

In the field investigation of Bt brinjal second round field cultivation, pesticide use was more prominent than the first round. Different pesticides have been used in several times beginning from transplanting to growth, development and bearing and harvesting of fruits. The major pests observed in the Bt brinjal field included virus, fungus, insect and mite. The virus infection included tulshi virus and mosaic virus. The fungi appeared as root rot, stem rot, wilting, leaf spot and fruit rot. The insect included aphid, leaf curling, whitefly, sucking insects, Fruit and shoot borer and many others. There was also infestation of red mite.

Thirty five types of pesticides including acaricide, insecticide and fungicide were sprayed several times in the Btbrinjal fields as per direction of the supervising officials.

Five banned insecticides including Basudin, Bidrin, Darsbun, Diazinon and Furadan were used in different Btbrinjal fields. Thirty other pesticides used in Btbrinjal fields were not from the list of 76 pesticides recommended for brinjal crop production in Bangladesh (List of registered agricultural bio-pesticides and public health pesticides in Bangladesh, approved up to 65th pesticide technical advisory committee meeting) [UBINIG, 2015].

Hiring Liars and Propagandists Instead of Evidence based Research

Mark Lynas is a frequent contributor and researcher at the Cornell Alliance for Science visited Bangladeshi Bt brinjal farmers, along with various scientists and others from Cornell University and the Bangladesh Agricultural Research Institute. His organized visit were aimed to make everything successful. He tried to counter the reports written by the Bangladeshi journalists [New Age, 2014] as false! He visited the same Bt brinjal farmer and found (!) the crop in good health and the farmer happy [Lynas, 2014].

Media attention to Mark Lynas is generated by mostly the drama he draws from his own life. He claims, his life begins as "the first anti-GMO activist in the world", but ends as an avid GMO supporter, desperate to make amends for the movement he started. Bill Gates' Foundation has set up a position for Mark Lynas at Cornell, as part of the controversial Cornell Alliance for Science. This allows Lynas to do paid promotion ofor GMOs "to the exclusion of almost everything else" [GMW, 2015].

In the response to the article, published as letter to the Editor on 4 May, 2015, Anne Lappe of Small Planet Institute said "Mark Lynas profile of one farmer in Bangladesh does not represent the facts on the ground about genetically engineered eggplant there. The trials of the new variety of eggplant have actually had very poor results: genetic engineering did not protect plants from most pests and have led to crop loss and debt for farmers". Also she revealed that "Mr. Lynas' Bangladesh visit was organized by the new Cornell Alliance for Science, funded by a $5.6 million grant from the Gates Foundation, that is promoting biotechnology, not dispassionately reviewing the science" [Akhter, 2015].

BBC Panaroma: Scandalous Promotion of Bt brinjal

BBC Panorama's programme, 'GM Food: Cultivating Fear', aired on 8 June, 2015 featured the pro-GMO campaigner Mark Lynas visiting a Bt insecticidal brinjal field and enthusing about the performance of the crop and claimed 90% success for this controversial GM crop in Bangladesh. The presenter Tom Heap, and his friend GMO promoter Mark Lynas, had grossly misrepresented the so-called success of the brinjal crop.

Faisal Rahman, staff correspondent for the United News of Bangladesh (UNB) and the author of the report titled '*Bt brinjal turns out to be 'upset case' for famers*' based on field visits and telephone interviews with farmers growing Bt brinjal in the second year Bt brinjal cultivation, challenged that there is no evidence to support the claim.

Faisal Rahman's report concluded that *"The cultivation of genetically engineered Bt brinjal in the country's several districts has cost the farmers their fortunes again this year as the plants have either died out prematurely or fruited very insignificantly compared to the locally available varieties."* His evidence, together with subsequent investigations by GMWatch, casts serious doubt on the credibility of the BBC Panorama programme [Robinson, 2015].

BBC Panorama featured the so-called success story of a farmer Hafizur Rahman, who was visited by Mark Lynas before. Lynas claimed that the Bt brinjal had "nearly doubled" productivity and that Hafizur Rahman had been able to sell the crop labelled "insecticide free". Lynas concluded, "Now, with increased profits, he looked forward to being able to lift his family further out of poverty." But after tracking down farmer Hafizur Rahman, UBINIG found almost every element of the Lynas narrative was misleading or false.

Visiting Hafizur Rahman UBINIG found that far from being a poor farmer that the GM crop is helping to lift out of poverty, as Lynas claimed, Hafizur Rahman is actually "a Polytechnic Graduate" and "well off commercial vegetable farmer". And the story about the GM crop enabling him to dispense with agrochemicals was far from the truth – multiple chemicals, including pesticides, were used on the crop. The farmer also complained that the Bt brinjal had a "rough surface and gets soft very quickly", unlike the traditional variety which is "shiny and remains fresh for a longer time" [GMW, 2015].

Two complaints were lodged to the Editorial Standard Committee (ESC) of the BBC Trust that its Panorama film **'GM Food: Cultivating Fear', broadcasted in June 2015, was biased and inaccurate and that it '***misled the audience by making a claim of success for a GM aubergine crop which is not supported by the evidence'.* BBC failed to provide source of the 90% success and only referred to Dr Frank Shotkoski, director of the Agricultural Biotechnology Support Project II (ABSPII) programme at Cornell University [GMW, 2015].

Conclusion

Bt brinjal started with Monsanto as a proprietary owner of the technology, but the real game was played by ABSPII of USAID and the Cornell University backed by Bill Gates Foundation. Fortunately Bangladesh land and environment has rejected the seed. It simply does not grow or give fruits. That's why they need propagandists like Mark Lynas and the so-called scientists to prove the 27,000 farmers of Bangladesh are happily (!) cultivating Bt brinjal.

And of course, you need Bill Gates to fund blatant lies, crooked science, commercial propaganda and destruction of agriculture and biodiversity of countries like Bangladesh.

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