Several studies on the interfertility of brinjal with some of its wild relatives have been carried out. However, these have been rather limited in number. *Solanum incanum* L., one of the bitter tomatoes[3], is the purported wild ancestor of the brinjal eggplant[4,5] and occurs naturally in some parts of India[6]. *S. incanum* is partially interfertile with cultivated *S. melongena*[7] and is also 'easily crossable' with *Bt* brinjal hybrids carrying the *Cry1Ac* gene[8]. Furthermore, in parts of India there are other wild, as well as semi-wild and weedy solanums, which are close relatives of *S. incanum* and brinjal, and tentatively names '*S. insanum* L.', '*S. cumingii* Dunal', etc. However, their precise taxonomic identities are, as yet, unclear and they are notoriously difficult to distinguish, both from each other and from *S. melongena* and *S. incanum*. Interfertility amongst *S. insanum*, *S. cumingii* and *S. melongena* has been demonstrated experimentally[9] and, along with *S. incanum*, these three taxa are therefore potentially successful acceptors of *Bt* brinjal pollen. Although the foregoing crosses were produced as a consequence of artificial cross-pollinations they are an indication of what may be possible in nature, where the naturally occurring relatives of brinjal often occur as adventives amongst or near cultivations. Although no instances of natural inter-specific hybridization with wild species have been reported for cultivated brinjal[10] this does not preclude the possibility of this phenomenon.

Wild relatives vary in their ability to form successful crosses with brinjal. For example, *S. kurzii* Brace ex Prain (= *S. sanitwongsei* Craib), a species of north eastern India, known as 'tita baigan', shows high crossing success with *S. melongena*[11]. *S. violaceum* Ortega (= *S. indicum* L.), found across much of India, shows some interfertility with brinjal according to Behera and Singh[12], but is also described elsewhere as being non-compatible with it[7]. There are still other wild species such as *S. barbisetum* Nees in need of study, which may show crossability with *S. melongena*.

On 9 February 2010, a moratorium on the commercialization of *Bt* brinjal was imposed in India. Scientists thus have a chance to develop a better understanding of the taxonomic inter-relationships of brinjal and its relatives, as well as furthering their knowledge of breeding behaviour. This would allow more accurate prediction of the likelihood of cross-transfer of genes, and may encourage the re-consideration of breeding strategies for untransformed brinjal involving wild relatives already possessing relevant pest and disease resistance.

A new ten-year strategic plan devised by the Parties to the Convention on Biological Diversity (COP10) will soon be put into action. It is comprised of 20 targets aimed at reducing pressures on biodiversity and taking urgent action to save and restore nature[13]. A certain number of these relate to the genetic diversity of crops and their wild relatives, and also to the management of biological invasions[14]. In this light, continued, careful consideration should be given to the study of the potential for cross-transference of genes between *Bt* brinjal and its wild and weedy relatives, and the possible implications.

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A small number of larval survival and reproduction of *Helicoverpa armigera* on *Bt*-cotton is not unexpected

This has reference to the article entitled 'Survival and reproduction of natural populations of *Helicoverpa armigera* on *Bt*-cotton hybrids in Raichur, India' by Ranjith *et al.*[1]. The authors' observations have been misinterpreted and publicized by certain NGOs and the media that this pest has already developed resistance to *Bt*-cotton and the technology is not effective! I wish to clarify the status.

It is known in plant protection practice that no matter what control measure is adopted, be it chemical insecticides or *Bt*-proteins, a small proportion of target pests can escape mortality and complete their life cycle. These may represent rare tolerant individuals or they may be insects exposed to lower toxin levels because of particular environmental circumstances. If they are allowed to breed among themselves, their progenies are also to be tolerant to the 'insecticide' or the 'protein' in question. In fact, a 'refuge' (non-*Bt* cotton and other host crops) can break this cycle of mating among the 'tolerant' individuals by making available a large number of susceptible moths. The planting of 'refuge' crops has been recommended as a proactive insect resistance management (IRM) strategy since the introduction of *Bt*-cotton in 1996 in USA and Australia, and subsequently in other countries, including India (in 2002).

Ranjith *et al.*[1] collected *H. armigera* larvae that survived on *Bt*-cotton (Bollgard and Bollgard II) and reared them to moth stage. Such moths were mated among themselves in confined conditions (tolerant males with tolerant females) with no choice and their progeny was shown to feed and breed on *Bt*-cotton. As explained earlier, this result is not surprising. In fact, such 'selective breeding' of a tolerant strain for several generations is a standard practice to evolve resistant strains in the laboratory to study resistance mechanisms and develop models to predict resistance development. However, field realities are different. In the field situation, the rare tolerant insects are most likely to mate with the abundant susceptible populations of *H. armigera* generated from 'refuge' crops and nearby host crops (chickpea, pigeon pea, tomato, etc.), thereby resulting in susceptible progenies.

Mere larval survival on *Bt*-cotton does not automatically mean that resistance has developed. For example, unusually high larval survival of *Helicoverpa zea*, a close relative of *H. armigera*, was recorded in 2002 in Mississippi and Arkansas[2], but the pest has not developed field resistance so far. In fact, in the year of Bollgard's commercial release in the US in 1996, unusual *H. zea* survival led to errant claims of resistance[3,4] in spite of previously published data[5] demonstrating the potential for such survival of non-resistant *H. zea.* Similarly, in Australia, *H. armigera* larvae were observed in some areas in Queensland on Bollgard II during 2005–2006, 2006–2007 and 2007–2008, but there is no sign of resistance development or increase in such populations[6] till date. It is to be realized that *Bt* technology is expected to provide effective protection of cotton crop against bollworms, but cannot ensure 0% survival and damage by bollworms. A small proportion of bollworm population survives on *Bt*-cotton and damages the crop to a limited extent. Ranjith *et al.*[1] have also acknowledged the lower damage on Bollgard and Bollgard II plants (4–8%) when compared to non-*Bt* cotton (30%). Survival percentage on *Bt* plants also depends on as how well the recommended agronomic practices like scouting for insects twice a week, taking other control measures if the population exceeds the economic threshold level, etc. have been followed in the field, which are not revealed in the article[1]. *H. armigera* survival or its reproduction under confinement, therefore, is not a new issue. How far these insects could proliferate under field conditions would be of interest. The present authors could have subjected the F1 progeny population (assuming the field survivors were F0) to bioassays (termed as reactive monitoring) with the *Bt* proteins. If there was a significant shift in LC_{50} relative to the established baseline susceptibility values for *H. armigera* in India, then there is a valid reason for concern. It is to be noted that the authors of the subject publication are not directly attributing the survival on Bollgard and Bollgard II fields to resistance to *Bt* proteins, but have rightly suggested to be watchful for signs of development and spread of resistance. Meanwhile, the opponents of *Bt* technology are exploiting the present publication to renew their attack on *Bt*-cotton to declare that bollworms have developed resistance and it is ineffective. This claim is receiving wide coverage in print and electronic media[7]. Such hasty conclusions are against scientific principles and should be avoided.

Large-scale commercial planting of Bollgard (expressing Cry1Ac protein) has been in practice since 2002 and Bollgard II (expressing both Cry1Ac and Cry2Ab) since 2006 in India. It is acknowledged that *Bt*-cotton has been mainly responsible for doubling the cotton yield due to effective control of bollworms and turning India from an importer of cotton to a major exporter. It has also significantly improved the socio-economic status of our farmers in the last eight years[8]. Resistance development is a natural phenomenon and efforts should be made to delay it as far possible through proper IRM strategies. The fact that no field resistance to *Bt*-cotton has developed in USA, Australia and other countries in the last 15 years is a testimony to this. Further work is already in progress to develop and utilize additional technologies to use proteins, *Bt* and non-*Bt*, with other modes of action and pyramiding with additional genes in *Bt*-cotton. Continuous research is needed to help farmers improve farm productivity and manage various challenges they face in their fields.

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