

## Royalty-free licenses for genetically modified rice made available to developing countries

Hopes that a new, life-saving, genetically modified rice will be grown in developing countries have been boosted with a decision that gives developing countries royalty-free licenses for technologies used to produce so-called golden rice. Rice enhanced with betacarotene, which is converted by the body into vitamin A, could help millions of people suffering with diseases caused by vitamin A deficiency.

The grain known as golden rice was developed with the support of the Rockefeller Foundation and others over several years by Dr Peter Beyer of the University of Freiburg in Germany and Professor Ingo Potrykus of the Swiss Federal Institute of Technology, Zurich. The technology involves modifying the DNA of the commonest rice plant, *Oryza sativa*, by adding bacterial and daffodil genes to produce rice cells capable of making betacarotene using certain methods patented by the life sciences company Monsanto. Monsanto have now agreed to provide royalty-free licenses for its technologies to help fast-track the further development and distribution of the rice.

"I now very much hope that others having intellectual property rights used in the development of golden rice will follow the generous example of Monsanto and also provide a royalty-free license for the humanitarian use of the technology and its transfer to developing countries," said Professor Potrykus, codeveloper of golden rice. Some 32 companies and institutions hold 70 patents for various technologies used to create the enriched rice.

It is estimated that 100 to 250 million children in the developing world do not get enough vitamin A. Vitamin A deficiency significantly increases the risk of severe illness and death as well as being the leading cause of blindness in developing countries. About 200 000 to 500 000 children become blind every year and half of them die within a year of becoming blind. An adequate intake of vitamin A could also reduce the mortality associated with infectious diseases like diarrhoea and childhood measles by boosting the activity of the immune system impaired by the lack of vitamin A.

Explaining the decision to make the golden rice licenses freely available, Hendrik Verfaillie, Chief Executive Officer of Monsanto, said: "We wanted to minimize the time

and expenditure that might be associated with obtaining licenses needed to bring golden rice to farmers and the people in dire need of those vitamins in developing countries." Some, however, have labelled the exercise a public relations exercise designed to reduce public concerns over the use of genetically modified foods. It is clear that much work remains to be done and it may take some years before countries can realise the potential benefits of these developments.

Dr Jorgen Schlundt, Coordinator for the Food Safety Programme at the World Health Organization, commented: "Before genetically modified rice can be widely introduced, scientific evidence will need to be provided to assure that the rice is safe and nutritionally adequate, does not pose unacceptable risks to the environment, and will provide the human health benefits suggested." He added: "WHO, along with the Food and Agriculture Organization of the United Nations (FAO), and the jointly sponsored FAO/WHO Codex Alimentarius Commission are developing the methods and criteria to be used for the international assessment and management of genetically modified foods, including requirements for the labelling of such foods and their products. WHO is studying possible human health hazards from the release of genetically modified organisms into the environment and, as a first step, the WHO Regional Office for Europe has organized a seminar on this topic for September 2000."

The report of the June 2000 consultation on genetically modified food held at WHO Headquarters in Geneva, as well as other related information, is available on the web at <http://www.who.int/fsf/GMfood/index.htm>. ■

Roger Dobson, *Abergavenny*

## Study in India confirms increase in drug-resistant cholera

Researchers in India have isolated strains of the bacteria that cause cholera which are resistant to some commonly used antibiotics, according to a new study published recently in the *Journal of the Indian Medical Association*. The researchers said that overuse of certain antibiotics may have contributed to development of the resistant strains and suggest that the use of certain key drugs be reduced to avoid progression and propagation of the resistant strains.

A recent outbreak of severe diarrhoea in West Bengal was already linked with the emergence of strains resistant to furazolidone, an antibiotic commonly used to treat cholera in children. In the latest study, a team from the National Institute of Cholera and Enteric Diseases in Calcutta analysed samples taken from 23 adults stricken with cholera during an outbreak in West Bengal in 1997. Bacteria isolated from the samples were all resistant to five commonly used antibiotics.

Resistance to one of the antibiotics, furazolidone, is particularly worrying, the researchers said. The antibiotic is the first choice drug for children who typically cannot tolerate more powerful antibiotics, such as tetracycline, because of side effects.

Diarrhoea due to cholera infection comes on suddenly but can take as long as five days to develop. Victims suffer from abdominal cramps, nausea, vomiting, dehydration, and, in severe cases, shock. The bacteria thrive in estuaries, lakes, rivers and coastal areas and are associated with blooms of zooplankton, especially copepods, which resemble tiny shrimp. The disease has been a particular concern for health authorities in India following recent widespread flooding in some districts.

Doctors have been warning for years that bacteria are becoming resistant to even the most potent antibiotics. Bacteria become resistant when microbes with a slight tendency to resist an antibiotic survive and pass on their genes; fully resistant bacteria eventually evolve. If a patient fails to take a full course of drugs to eliminate a particular infectious agent, resistance develops even more quickly.

Earlier this year, a team of scientists announced that they had sequenced the entire genome of *Vibrio cholerae*. In the long term, scientists hope to use the sequence information to identify and remove genes associated with the disease which should facilitate the development of a safe and effective vaccine. ■

Scott Gottlieb, *New York*

## Use of the Internet as a public health intervention tool for an outbreak of syphilis

A recent study of a syphilis outbreak amongst homosexual men in San Francisco showed a significant association between the use

of the Internet as a means for meeting sexual partners and acquiring syphilis (*Journal of the American Medical Association*, 2000, 284: 447–449). In a case–control study, infected individuals were almost four times as likely to have met their sexual partners in an Internet chat room, an electronic forum which allows the exchange of messages via computer, compared to a non-infected control group of homosexual men who presented to a clinic.

The study highlights some important points that need to be considered for public health interventions amongst risk groups with access to the Internet. Since the outbreak occurred amongst homosexual men who met their partners through a chat room partner information was in most cases limited to fictitious “screen names”. For potential legal and privacy reasons, the Internet Service Provider refused to release the names of the individuals using the chat room without a legal order. To circumvent this, an awareness campaign was initiated with the cooperation of the Internet Service Provider.

For two weeks, a San Francisco marketing firm accessed the chat room by sending electronic messages giving advice to persons with sexual contacts to seek medical evaluation. The San Francisco Department of Public Health also sent messages to the screen names to notify partners of their possible exposure to syphilis. The syphilis control efforts during late July 1999 resulted in an 18% increase in the number of homosexual men evaluated at the San Francisco Department of Public Health City Clinic in early August compared to the month of July. Seventy one per cent of individuals who responded to a questionnaire thought that the awareness campaign was appropriate.

Dr Jeffrey Klausner, head of the Sexually Transmitted Diseases Unit of the San Francisco Department of Health and one of the coauthors of the study, informed the *Bulletin*: “The Internet has become a valuable source of information on health and disease for individuals and a new opportunity for health promotion and disease prevention activities. Ultimately, the balance between increased social connectivity and disease transmission versus health promotion and prevention activities will dictate the effect the Internet has on public health.” He added: “In locales where Internet use is common, those who are engaged in improving public health should assess Internet use and collaborate with local Internet Service Providers to promote health and prevent disease.” ■

Barry Whyte, *Bulletin*

## New fly trap may reduce prevalence of blindness from trachoma

Home-made fly traps using old plastic bottles and faeces may significantly reduce the prevalence of trachoma, a disease that is a major cause of blindness in the developing world. Results of tests of the devices in Kenya have shown the traps can reduce household fly populations by almost half, and the numbers of cases of trachoma by more than one-third.

According to the World Health Organization, which three years ago launched a programme to eliminate trachoma by 2020, the disease has resulted in blindness in around six million people in the world. Trachoma is a bacteria-related infection that is one of the world’s leading causes of blindness. Cumulative attacks by *Chlamydia trachomatis* result in local tissue inflammation and a sticky mucous is produced. This can lead to a tightening of the eyelid, making it bend inwards, and the eyelashes may damage the surface of the cornea. In some cases, this may lead to eventual blindness.

The latest technique, the development of which was supported by the Royal College of Surgeons in Ireland, is based on an original idea from Professor David Morley, a retired specialist in tropical child health at the Institute of Child Health in London, and Dr Michael Elmore-Meegan of the International Community for the Relief of Starvation and Suffering (ICROSS). The device uses two transparent drink bottles, mounted one above the other, to create a fly trap and exploits the concept that once they have had a meal, flies almost always fly upward and towards the brightest available light.

In the trap, the flies are first lured through the fly ‘ports’ into the bottom bait bottle, which is covered with mud so that it is dark on the inside, or with dark paint poured in and distributed evenly by twisting the bottle. The bait in this lower bottle is early morning breastfed baby’s stool and urine or milk that has gone sour. After eating, the flies move up through a tube attracted by the light emitted from the transparent bottle above which must be small ventilation slits or holes. Once in the upper bottle, the insects will stay until they die of exhaustion.

After a year long trial of the traps in 300 Maasai homes in Kenya, researchers reported that the fly population decreased by 40%. At the same time, the number of cases of trachoma decreased by 36%.

One big advantage of the traps, if they do prove to be effective in the long term, is that they are cheap to produce. According to Professor Morley, Maasai children were

able to make the traps as part of a homework project at very low cost. ■

Roger Dobson, *Abergavenny*

## Correction

In Vol. 78, No. 8, on pages 1062–1063, several errors occurred in the news item *Deficiencies in immunization campaigns highlighted in new UNICEF report*, for which we apologize.

The corrected sentences are given below:

Page 1062, first paragraph: The impression was given that efforts exist to eradicate diphtheria, pertussis, and tetanus. The first sentence should read: “... immunization programmes aimed at the control of diphtheria, pertussis, and tetanus and the eradication of poliomyelitis are still failing to reach many children, leaving them at risk of catching these diseases”.

Page 1062, second paragraph: Vaccination efforts were mistakenly attributed solely to UNICEF. The second sentence should read: “... is still lagging behind the goals of the organization and its partners...”.

Page 1063, first paragraph: Poliomyelitis eradication efforts were mistakenly attributed solely to UNICEF. The first sentence should read: “... Among its efforts, UNICEF and partners have set about an ambitious agenda to eradicate poliomyelitis...Despite these efforts, the report makes clear that these and similar tasks will not be easily achieved”.

Page 1063, paragraph 4: The text mistakenly indicates that diphtheria, pertussis, and tetanus vaccine is administered to mothers. The second sentence should read: “while diphtheria, pertussis, and tetanus vaccine can be easily administered by immunizing children, the vaccine...”.

Page 1063, fifth paragraph: Vaccination efforts were mistakenly attributed solely to UNICEF. The first sentence should read: “UNICEF and partners have set a goal of immunizing 90% of children in all countries...”.

Page 1063, paragraph 7: The timing of the administration of diphtheria, pertussis, and tetanus vaccine is incorrect. The second sentence should read: “... administered at the ages of 6, 10 and 14 weeks...”.

Page 1063, paragraph 10: The value of US\$ 750 is incorrect. The sentence should read: “...the commitment of US\$ 750 million by the Bill and Melinda Gates Foundation...”.