Bacterial Disease Resistance in Plants: Molecular Biology and Biotechnological Applications. P. Vidhyasekaran. Food Products Press, An Imprint of Haworth Press, Inc., 10, Alice Street, Binghampton, NY 13904-1580. USA. 2002. 452 pp. Price: US $ 59.95

Bacterial plant diseases cause huge economic losses in several countries across the globe. Several bacterial diseases like citrus canker, moko wilt of banana, cotton black arm, apple fire blight, soft rot of potato and other vegetables affect the national economies of many countries. These diseases are widespread in North and South America, Europe and Asia. Bacterial blight of rice is one of the most important bacterial diseases in India, causing an yield loss of 2–81%. Chemical control of bacterial diseases is almost impossible, as antibiotics are not recommended due to development of antibiotic-resistant strains. Development of resistant varieties has resulted in limited progress because few resistant genes have been identified and the bacterial diseases are mostly race-specific. Several races of the pathogen exist and the resistance breaks down in the field. The interaction of plants and bacterial pathogens is a carefully regulated process at the level of transcription. Thus an understanding of the molecular basis of interaction between pathogenic bacteria and plants is important for designing new strategies for controlling bacterial plant diseases. During the past decade, molecular biology of bacterial pathogenesis has received a lot of attention, and several universities and organizations around the world have taken up intensive research programmes with the aim of developing new strategies for bacterial disease management.

There are few authentic compilations with systematic coverage of all the important areas of plant bacterial interaction at the molecular level. The book under review is a timely contribution in understanding molecular aspects of bacterial plant diseases. It also gives an excellent outline of research needed to exploit molecular biological tools for bacterial plant disease management.

The book has six chapters. Each chapter has a detailed overview of topics covered for easy understanding. Chapter one covers the molecular recognition process between the plant and the bacteria. The review also covers bacterial genes and their transcriptional up-regulation involved in the recognition process. Signal transduction involved in bacterial pathogenesis is also discussed. Bacterial elicitors and their role in host recognition and resistance development have also been discussed. Chapter two gives an indepth review of host defence against bacterial plant pathogens, structural cell-wall modifications, cell-wall proteins and their genes and regulation. The role of bacterial extracellular enzymes in induction of defence responses and in virulence has been reviewed in detail. The section describing virulence genes and polygalacturonase-inhibiting proteins has been well presented.

The role of active oxygen species (AOS) in bacterial disease with an emphasis on mechanism of production, regulation and possible role in disease resistance has been reviewed in chapter three. Although AOS are toxic to bacteria, many bacteria have developed mechanisms to protect themselves from toxic AOS. The role of bacterial elicitor molecules in triggering host antioxidant enzymes which detoxify AOS has been reviewed.

Chapters four and five are devoted to the role, occurrence and mechanism of induction of plant proteins and secondary metabolites like PR proteins, HRGPs, lectins and phytoalexins in bacterial plant disease résistance. The sections covering PR proteins are especially well written, with the review including classification, occurrence, properties and the role of individual PR proteins in bacterial disease resistance.

The last chapter unravels several new biotechnological options to manage bacterial diseases in plants based on the knowledge of molecular basis of disease resistance. This chapter gives an excellent overview of manipulation of signal transduction and resistant genes for creating bacterial disease resistance through transgenic technology. Several transgenic crops expressing defence genes targetted against bacterial plant pathogens have been listed. An exhaustive list of introduced traits and the defence proteins induced through transgenic has been well reviewed. Newer and alternative approaches for disease control, like activation of disease resistance and development of immunity against bacteria, have also been covered. Several biotic and abiotic inducers of host defence response have been listed with their mode of action. Successful reports on the use of anti-bacterial proteins from bacteriophages, humans, insects and birds that have been transferred to plants are discussed. The concluding chapter also focuses on the disadvantages of using transgenic plants to control bacterial diseases and the technologies needed to overcome these disadvantages.

This is an excellent book and contains a wealth of information in a consolidated form. The book covers a vast area ranging from basic research to molecular applications in disease control. The coverage of the text is exhaustive and is resourced from a vast array of related scientific literature, as evident from more than 100 pages of reference. The book gives a simple description of many complex processes in bacterial plant disease resistance. The description is simple enough for beginners as well as traditional plant pathologists. The book is well produced, with good quality figures and representations. It has a precisely documented subject index for easy browsing. It will be an invaluable resource for researchers, teachers and students involved the field of plant pathology.

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Wine: A Scientific Exploration. M. Sandler and R. Pinder (eds). Taylor and Francis Books Ltd, P.O. Box 6329, Basingstoke, Hampshire RG 24 8 DR, UK. 2003. 320 pp. Price: US $ 65.

'A man wants a drink because it makes a new man out of him. The problem is that the new man wants a drink'. I remember those lines from an old Robert Redford movie, though not the name of the movie. Contrast that with the opening line of the book: 'There are more old drunkards than old doctors' . . . , said Benjamin Franklin.' This multi-author book was a pleasure to read. It does not exactly replace the book of verse so well recommended in the *Rubayats* (which it quotes well enough), but it does eloquently argue for the cup of wine, regardless of who else is with you in the wilderness. There are so many things to talk about wine. The book indulges in many and well.

The first and foremost is that while wine obviously antedates coca cola and all other similar beverages, it has one commonality in that fortunes have been made even in ancient times selling wine, since it was the only beverage that lasted longer than the shipment time. In contrast, (if we are to believe the press reports), it was the only safe drink available then, as the water in cities was heavily polluted! The second equally important observation is that it was considered medicinally as good, if not better, than honey in all ancient systems of medicine. In fact, Paracelsus gave the word alcohol which came from the word for antimony, al-kohl, as it was considered a good curative stuff! And he used wine as antiseptic for surgery. The early chapters are full of such lore.The medical evidence in support of wine was more recent.

There are fascinating things about wine that you can learn from the book . . . the first recorded winemaking was from Georgia (7000 BC) . . . long tradition in bootlegging indeed! Then there is this deep archaeological uncertainty . . . if you saw grape pips at the bottom of a sealed jar which is some 3000 years old, was it wine or stored raisins or whatever? The thing to do, of course, is to analyse the sediment using diffuse-reflectance Fourier-transform infrared spectrometry, which indicates the presence of tartaric acid that occurs naturally in large amounts only in grapes. This exercise solved what was in some 700 sealed wine jars in three rooms of the tomb of Scorpion I at Abydos in Middle Egypt. Add another small exercise in HPLC and what have you – a clear trace of aromatic residues from resin of the terebinth tree, no doubt to keep the wine going without turning into vinegar for the departed king in his afterlife.

One author was definitely confused about Indian wines and soma. There does not seem to be any reason to think that soma was a wine, . . . more likely, it was an extract. The Mediterranean tradition, which preoccupies the West, is far more illuminating. Aristotle prescribed wine, aphrodisiacs and music for melancholia and the authors muse that the treatment would work even today. In case anyone thinks that Aristotle's prescription was rather incomplete, you should know that there was always someone to play that music. The Greeks were not very particular about who played the music.

There is a definitive place for wine in religion, at least in the West. Interesting accounts all point out the enormous contributions of the monks to good living . . . the champagne, Dom Perignon being a case in point. Breeding a St. Bernard is one thing, but what goes into the cask on its neck is another. But even at a more significant level, a great deal of the Jewish and Christian religions have wine and vineyards deeply intermingled with the rituals and the lore.

Brand equity started early, where else but in King Tut's tomb! We learn that the 26 wine jars found were labelled clearly: Aperershop, the Syrian made the wine in jar 1; Khay, in half a dozen others. What vintage, since it was not clear whether the bottle labelled as of 'year 31' was from Amenhotep III's regime or it was new wine in an old recycled bottle (Bombay Scotch?).

The story I found fascinating has to do with an account on vines and infection. The French vines were decimated by *Phylloxera* infection that attacked the roots. While crops were being destroyed, scientists discredited each other by taking positions for and against the involvement of *Phylloxera* (Surat plague? Bhopal tragedy?). Finally, it was settled that the scourge came from USA back to France along with some imported vines. When treatment with carbon disulphide was recommended to kill *Phylloxera* in the roots, the farmers chased out of their fields the agents who came to adminster the drug, since the treatment was worse than the disease. The final solution was to smuggle American vines which are resistant to *Phylloxera*. Ultimately, hybrids of the American and French varieties were effective, *Phylloxera* being a continuing threat and the battle between the use of the traditional vines and modern hybrid vines also continuing unabated among the academicians.

The major contribution is a series of chapters on wine and health. All the mythology of traditional medicinal plants is carefully incorporated in trying to uncover the French paradox . . . why this wine-bibbing nation with all the heavy risk factors (like blood pressure, cholesterol, smoking, fat intake and obesity) has far less ischaemic heart disease. Klatsky quotes an Irish Physician, Samuel Black (1819) who perhaps first observed the French paradox and wrote of the probable cause as 'the French habits and modes of living, coinciding with the benignity of their climate and the peculiar character of their moral affections!' The original claim of wine being beneficial was replaced by a more broader claim that alcohol per se is beneficial. Though the authors specifically do not favour it, the medical community per se is probably more impressed by the Framingham heart study, which created a benchmark in longitudinal epidemiology. The message is clear; coronary heart disease is less if you take a drink or two everyday. Heavy drinking is another matter. Keep off alcohol if you have high blood pressure. The matters become even more interesting as dementias are reduced by alcohol too.

Is alcohol all there is to it or has wine some beneficial compounds? Among a variety of flavonoids and stilbenes, Resveratrol (3,4,4′-trihydroxystilbene) received wide attention in a variety of dieases, cancer and so on. . . . Earlier, Goldberg and Soleas concluded elsewhere that though this much-acclaimed compound (in the lay press) has dramatic effects in cell cultures, it was hardly useful even in intact mice and therefore was of no potential use. They have now revised their view to a mild extent that it may be worth looking at further. The choice is either more potent analogues or recycling this compound in socially acceptable placebos, generally labelled as natural products and sell by buckets to health addicts who are anyway fond of all things herbal. The antioxidant activities remain at the general level of this research in plant products, which is not saying much. The effect of these compounds on nitric oxide production and modulation does not raise even hopes!

The book starts by asking the question: Does the glass make a difference in drinking wine? Do different parts of the tongue have different sensitivities and does the nature of the glass contribute to the access to the relevant taste buds? I was reminded of my smoking days; when the lights went out, smoking was no fun because one has to see the smoke to enjoy smoking. Does the glass make a difference? Yes, you see the crystal, don't you? Wine from grapes is not the only wine. The word honeymoon comes from the old pagan custom of drinking from moon to moon, wine made from honey (mead wine), which makes a jolly good wine.

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