

BOOK REVIEW

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Review of: *Nonhuman DNA Typing, Theory and Casework Applications*

REFERENCE: Miller Coyle H, editor. *Nonhuman DNA typing, theory and casework applications*. Boca Raton, FL: CRC Press, 2008, 225 pp.

The last 10 years have seen an increased interest in forensic DNA typing for biological evidence from animals, plants, and other organisms. Molecular techniques and sequencing data are available since many prokaryotic and eukaryotic species are being studied as model organisms, for basic research, or due to their agricultural relevance. Forensic laboratories have been able to use this foundation to establish assays for species identification or DNA individualization for organisms as diverse as anthrax, marijuana, cats, blow flies, and moose.

Nonhuman DNA Typing, Theory and Casework Applications, the latest addition to the CRC Press International Forensic Science and Investigations Series was edited by Heather Miller Coyle and provides an overview about DNA typing efforts focused on animal, bacterial, and fungal DNA. A separate volume entitled *Forensic Botany* by the same author was published in 2005. The new volume covers various topics including background information on forensic evidence collection and DNA typing techniques in Chapters 1–3. Chapter 4 deals with canine DNA identification using STR analysis. Dog hair, blood, or saliva can be probative as possible transfer evidence in human on human crime and in dog attack cases. Aside from examples for canine specific STR multiplexes and the associated sequence and heterozygosity information, this chapter also offers a very valuable discussion on the issues surrounding dog breeding and genetic diversity. Any type of DNA identification involving domestic animals has to consider the implications of lack of random mating on population structure and random match probability estimates. The same issue is being raised in Chapter 5 on feline STR analysis, where similarly detailed information on existing STR cat assays, population data, and mtDNA applications is provided. The authors end with a brief outlook on future research areas including possible phenotypic markers.

Chapter 6 is a very brief overview about forensic entomology focusing on more recent publications. Aside from basic information on postmortem interval determination, this chapter includes a paragraph on insect evidence in civil cases. The author of Chapter 7 on wildlife forensics points out that DNA typing is imminently suitable for wildlife investigations since in classic poaching cases the collection of biological material from the “victim” is the actual purpose of the crime, as opposed to a homicide case where the transfer of biological evidence is mostly unintentional. This initial advantage is quickly obliterated if the evidence is subsequently

smoked, tanned, or pulverized. The contribution offers an excellent introduction to the field of wildlife forensics, covers many technical issues, and provides detailed analytical advice down to the level of template reports. Chapter 8 is a collection of brief contributions providing different animal DNA typing scenarios. One of the topics presented is a 17-plex horse microsatellite kit with demonstrated value in pedigree verification and horse breeding that could potentially serve as a forensic tool.

The following Chapter 9 offers a comprehensive review of the forensic aspects of fungal biology. Fungal toxins and poisons are topics in forensic toxicology and food safety; fungal colonies on bones can aid in the assessment of postmortem intervals; while fungal growth on bones, textiles, or leather can alter biological evidence and potentially destroy its value for the investigation. Species identification on a molecular level is the basis for the distinction between hallucinogenic and nonillicit species, or the detection of bio-terrorism agents. The authors emphasize the need for standardization and research, and provide many citations for further reading. Chapter 10 on soil DNA typing includes a very good introduction to existing methods for forensic soil comparisons and the DNA techniques available for the characterization of microbial communities within a soil sample. Most of the current PCR based methods are able to detect high levels of diversity but reproducibility is a concern. Seasonal changes, variations caused by individual plants, or postcollection storage conditions can alter a soil community profile, limiting a forensic expert’s ability to compare two samples. The last chapter and the appendix are not related to the field of nonhuman DNA typing. Chapter 11 evaluates a commercial DNA testing service providing information on the ethnic ancestry and the possible phenotype of a biological evidence source. The appendix covers a brief history of blood group and DNA typing.

The individual chapters in this small volume vary in their approach. While some include technical details and scientific language clearly targeting forensic scientists and researchers, other contributions are more suitable as general information for a lay audience. Given the title of the book, it would have been appropriate to omit the chapter on human phenotype prediction and include at least a general review about DNA typing of plant evidence; the latter would have been helpful for all readers who do not have access to the separate volume on forensic botany. Overall *Nonhuman DNA Typing, Theory and Casework Applications* provides a comprehensive introduction to the field and can be recommended. The quality of the discussion about open issues and future research needs, and the extensive reference lists provided by several of the authors make this volume a useful resource for practitioners and researchers.

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