IAWA LIST OF MICROSCOPIC FEATURES FOR HARDWOOD IDENTIFICATION

with an Appendix on non-anatomical information

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Published for the International Association of Wood Anatomists at the Rijksherbarium, Leiden, The Netherlands

PREFACE

This list of microscopic features for hardwood identification is the successor to the 'Standard List of Characters Suitable For Computerized Hardwood Identification' published in 1981 (IAWA Bulletin n.s. 2: 99–145) with an explanation of the coding procedure by R.B. Miller. The 1981 publication greatly stimulated international exchange of information and experience on characters suitable for hardwood identification, and inspired considerable debate on the most desirable coding procedures and identification programs. Therefore, at the IAWA meeting during the XIV International Botanical Congress in Berlin, July 1987, it was decided to revise the 1981 standard list. Because of the continuing developments in computer technology and programming, it was agreed to limit the scope of the new list to definitions, explanatory commentary, and illustrations of wood anatomical descriptors, rather than concentrate on coding procedures.

A new Committee was appointed by the IAWA Council to work towards the new list, and thanks to a substantial grant from the USDA Competitive Research Grants – Wood Utilization Program (Grant No. 88-33541-4081), a workshop was held by the Committee from October 2–7, 1988, in the Department of Wood & Paper Science, North Carolina State University, Raleigh, NC, USA, under the joint auspices of IAWA and IUFRO Division 5. A preliminary list was prepared during the workshop. IAWA members were invited to comment on this list, and these comments helped with the final preparation of the new list. The list presented here was agreed to after review of subsequent drafts and extensive internal consultation between committee members.

Although this list has 163 anatomical and 58 miscellaneous features, it is not a complete list encompassing all the structural patterns that one can encounter in hardwoods. Instead it is intended to be a concise list of features useful for identification purposes. Also, the numbers assigned to each feature in the present list are not meant to be codes for a computer program, but are intended to serve for easy reference, and to help translate data from one program/database to another.

Wood and wood cells are biological elements, formed in trees, shrubs, and climbers to fulfill a physiological or mechanical function. Although there is more discrete diversity in wood structure than in many other plant parts, there is also much continuous variation, and any attempt to classify this diversity into well-defined features has an artificial element. Yet we are confident that in the feature list presented here ambiguity of descriptors has been limited to a minimum, and we hope that all present and future colleagues engaged in wood identification and descriptive wood anatomy will find this list a valuable guide and reference.

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ACKNOWLEDGEMENTS

The IAWA Committee is greatly indebted to the following institutions and individuals:

The USDA Competitive Research Grants–Wood Utilization Program (Grant No. 88-33541-4081) for financing the IAWA/IUFRO Workshop in Raleigh, North Carolina, and subsequent meetings in London and Leiden by P. Baas, P.E. Gasson, and E.A. Wheeler.

The Department of Wood and Paper Science, N.C. State University for offering hospitality and facilities during the IAWA/IUFRO Workshop in Raleigh; especially Dr. C.A. LaPasha and Ms. Vann Moore for help with preparation of the various drafts, and Ms. Mille Sullivan.

The Forest Products Laboratory, Madison, Wisconsin, USA, for providing financial support towards the printing costs of this special issue.

The Jodrell Laboratory, Royal Botanical Gardens Kew, UK, for supporting photographic work, and providing facilities and hospitality during a meeting in March 1989 for the selection of illustrations.

The Bailey-Wetmore Laboratory of Plant Anatomy and Morphology, Harvard University, and Dr. P.B. Tomlinson, Dr. D. Pfister, and Dr. A. Knoll for giving access to the Bailey negatives and darkroom facilities.

The Rijksherbarium for various facilities; especially to Ms. Emma E. van Nieuwkoop for mounting the plates, and lay-out editing.

All IAWA Members who have kindly given their comments on various drafts of this list:

K.M. Bhat, India
Lim Seng Choon, Kepong, Malaysia
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T. Fujii, Tsukuba, Japan
H. Gottwald, Hamburg, FRG
Mary Gregory, Kew, UK
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Alberta M.W. Mennega, Utrecht, The Netherlands
C.A. LaPasha, Raleigh, NC, USA
A. Londono, Columbia
Paula Rudall, Kew, UK
M. Seth, India

Acknowledgements for illustrations

Photographs by courtesy of:

I.W. Bailey, Bailey-Wetmore Laboratory of Plant Anatomy and Morphology, Harvard University: 10, 11, 16, 18, 39, 57, 58, 64, 65, 148.

Blumea: 38, 44, 73, 74 (Baas 1973), 174 (Van Vliet 1981).

P. Détienne: 129.

P.E. Gasson: 2, 4, 7, 8, 12, 19, 21, 26, 28, 30–34, 36, 37, 40, 45–54, 63, 66, 75, 78–82, 84–86, 88, 90–93, 95–99, 102–106, 111, 114–116, 118, 120, 122, 126–128, 130–135, 137–144, 151, 153, 154, 156, 157, 159, 161, 163–168, 171, 172, 176, 178, 180–182, 188.

D. Grosser: 15, 27, 29, 55, 68, 71, 72, 112, 113, 146, 158, 170, 173, 177.

EXPLANATORY NOTES

Quantitative Features — For quantitative features of general applicability (e.g., vessel frequency, tangential vessel lumen diameter, vessel element length, and fibre length), this list includes broad categories for easy use when identifying unknowns, as well as more precise quantitative descriptors (mean, range, standard deviation). When constructing a database the numbers of samples as well as the number of measurements or counts done per sample should be recorded. Different computer programs allow storage of different amounts of information (e.g., all measurements, or just the means, ranges, and standard deviations), and use different algorithms for matching quantitative features. This publication does not recommend a particular program or a particular method for the storage and retrieval of quantitative data, but provides some guidance on how to obtain these data.

Variable Features and Relative Abundance — Because of wood's inherent variability, it is inevitable that some features will be well-defined in some samples while absent or ill-defined in other samples of the same species. Accommodating such variability has always been a problem in key construction, and most keys (computerised or otherwise) have provisions for such situations. Describing relative abundance of some features, e.g., prismatic crystals, is also problematic, and textual comments on relative frequency should be added to a description or database. In this list of descriptors, some features apply only when the characteristic is of common occurrence. For such features, the illustrations and examples are intended to help interpret 'common'. Although many keys have used these same features accompanied by the same qualifier 'common', there have been no extensive systematic analyses to determine what per cent occurrence constitutes 'common'. Therefore no quantitative criteria for 'common' have been offered in this list.

LIST OF FEATURES

Name

ANATOMICAL FEATURES

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2. Growth ring boundaries indistinct or absent

Vessels — p. 236

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4. Wood semi-ring-porous
5. Wood diffuse-porous

Vessel arrangement — p. 238
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Vessel groupings — p. 242
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    16. Scalariform perforation plates with 10–20 bars
    17. Scalariform perforation plates with 20–40 bars
    18. Scalariform perforation plates with ≥ 40 bars
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Intervessel pits: arrangement and size — p. 250
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22. Intervessel pits alternate
23. Shape of alternate pits polygonal
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Vestured pits — p. 252
29. Vestured pits

Vessel–ray pitting — p. 253

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31. Vessel–ray pits with much reduced borders to apparently simple: pits rounded or angular
32. Vessel–ray pits with much reduced borders to apparently simple: pits horizontal (scalariform, gash-like) to vertical (palisade)
33. Vessel–ray pits of two distinct sizes or types in the same ray cell
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47. 5–20 vessels per square millimetre
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51. Mean, +/– Standard Deviation, Range, n = x

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53. 350–800 µm
54. ≥ 800 µm
55. Mean, +/– Standard Deviation, Range, n = x

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59. Wood vesselless

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117. Wood rayless

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  174. Pacific Islands (including New Caledonia, Samoa, Hawaii, and Fiji)
175. Australia and New Zealand (Brazier and Franklin region 77)
  176. Australia
  177. New Zealand
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192. Wood of commercial importance

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