

Pathological Wood Anatomy

- A niche among many traditions and dogmas -

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Sixty years is a milestone not just in the life of everybody but also in institution and organization. Sixty years are living proof of history. To become an outstanding position, we have to have endured a long journey. You did not get here purely on your own. I want to give my heartfelt congratulations to 日本木材學會, exhibiting such tremendous achievements to reach what it is today by doing with dedication, passion and enthusiasm. In addition, I would like to give a special thanks to Japanese colleagues who give me this special opportunity. My membership in 日本木材學會 started almost forty years ago when I worked as an assistant in Chonnam Nat'l Univ. I have to pay homage to my Japanese colleagues who helped since then. When suffered from an intellectual standstill and regressing into a third-world mentality, commitment and drive to return self-confidence is a blessing. Special thanks to Prof. R. Funada and his colleagues giving me this significant opportunity.

Pathological wood anatomy handles the unusual structures in woody plants, deviated from the normal structures caused by genetic factors, abiotic environmental stresses, and attack by pathogenic organisms (fungi, bacteria, insects, and termites etc.). Due to its fundamental interests but also for the economic importance, the pathological plant anatomy has been developed at the end of the 19th century. The first Japanese wood anatomist Dr. Nakamura studied also at the lab of pathological wood anatomy during his doctoral works at Munich University under Prof. Robert Hartig in 1880's. However, this study has not been well transmitted and developed in the Japanese islands when compared to traditional descriptive wood anatomy.

Wood anatomy covers the comprehensive understanding the biological aspects of secondary xylem from its formation to its degradation and utilization. However, traditional wood anatomy has focused mainly on descriptive examination of diverse wood species in specific areas. Molecular biology establishes the new orthodoxy in the 21st century. Recent approaches in biochemical and molecular biology opened our perspectives to elucidate every aspects of development in living organisms at the level of the genes. In particular, introduction of electron microscopy and technical improvement in microscopy (histochemistry, immunocytochemistry, laser scanning confocal microscopy, image analysis) allow to link structural aspects in woody plants with physiological functions and with ultrastructural alternations of the individual cells to a greater extent.

If we incline only to the structure of “norm”, wood anatomy might be regarded as “old-fashioned” in the time of molecular biology. Traditions and norms sometimes work a trap for the development of science and technology. Because of that, the best scientists might be stuck in the middle of tradition and dogmas. The boundary-respect conception has been changed now into the boundary-suspicious conception. The prevailing model of single subject is not appropriate to provide the entire scope and spectra. In this respect, pathological wood anatomy can be at least a filling-in of a rather unimportant gap in the traditional descriptive wood anatomy. It can provide diverse lenses to understand the whole scope and spectra of biosynthesis and biodegradation in the secondary xylem, by crossing over the intellectual barriers and by the diverse approaches.

There is a saying that “hard skills can be learned, whereas soft skills need to be developed”. To think outside of disciplinary boundaries, not just operating within a tradition

is to do science. Wood is just the grain of sand; it is up to wood anatomists to make the pearl. Wood, produced by the secondary xylem, is an interface of material and living organism. As long as the tradition of soft skills and critical thinking are alive, wood anatomy can't be a "fossil" study in the field of wood sciences and technology. Morphology was once dismissed as the mere description of dead organisms in 1860. History of science suggests us to overcome the conventional dogmas of today; science makes us a freer one.

Last but not least, it is to be recommended particularly to those who have strong professional loyalties to traditional descriptive wood anatomy, to read the older publications to overcome the tradition and dogma. "Many of the 100 year-old research papers are still better than some of the more recent papers in the field of wood anatomy" [Fink, 1999]. All the older publications are not always outdated in wood anatomy. Achievement of anatomy, regardless of plant or animal, would be seen as the products of the continuous series of mini-revolutions rather than revolutionary big one (to use Thomas Kuhn's term; shift of paradigm). Breakthroughs to new levels of knowledge do not occur frequently in anatomy. Even significant achievements might be the byproducts and/or accumulation of the day-to-day endeavors. In this regard, the old papers written in German by Japanese wood scientists at the end of 19th and early 20th century should be thoroughly re-examined, though not readily available to English-speaking scientists.