Introduction

Description

Lignin (from the Latin *lignum*, meaning wood) is a major component of the vascular plant cell walls. Recently, the presence of lignin has been reported in nonvascular plants and red algae Martone et al., 2009 (EspiÃ±eira et al., 2011). As one of the most abundant biopolymer on Earth, lignin is an amazing plant cell wall macromolecule in that, although it has been studied for more than a century, its structure is still not completely understood. There are multiple reasons that explain our lack of understanding of the heterogeneous lignin macromolecular structures in the native state *in planta*. One of the first reasons is that, due to its low solubility in most solvents and its tight interconnection with the other plant cell wall constituents, it is not possible to extract a true â??protoligninâ?• in its native state without breaking bonds. Another consequence of this lack of solubility in conventional solvents is that in order to study lignin, one must break it down and convert it into smaller derived fragments. A second reason, as we will develop it later in this article, is that there exists a large diversity of lignin types, not only due to botanical origin, but also within a same plant in such a way that any lignin fraction extracted from a plant is actually a mixture of several molecular types. As a result, what has been described under the general term of lignin is actually an average of several entities. Due to such a compositional diversity and structural plurality, it is more appropriate to use a plural form and refer to this natural plant polyphenolic constituent as *â??**lignins**â?•*.