Título: LATE-HOLOCENE ENVIRONMENTS RECONSTRUCTED FROM PEATLANDS: LINKING GEOCHEMISTRY AND PALYNOLOGY

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Resumen: The principal aim of the PhD work presented here is to explore how geochemistry and palynological approaches on peatlands, particularly when considered together, can help in the understanding of Holocene (the last ~11600 years) environmental changes. To achieve this general aim, different types of peatlands (ombrotrophic and minerothrophic), environments (boreal and temperate zones) and Holocene chronological intervals (although with special attention to the Late Holocene) have been studied. The focus has been on gaining insights into how different environmental stressors ¿such as climate and human activities¿ influenced past environments. In particular, the following processes have been addressed: 1) natural- and human-induced

soil erosion and its relation with forest evolution and hydrological changes on wetlands; 2) changes in past climate and its relation with peat organic matter decomposition, vegetation and other aspects of the environment, including human activity, and paying special attention to the Little Ice Age period, and 3) trends in past atmospheric metal pollution and its possible link with changes in the tree cover. Within geochemistry, both physical (loss on ignition and density of the peat) and chemical (elemental composition, carbon and nitrogen stable isotope ratios, lead isotope ratios, peat humification and infrared spectroscopy) analyses were applied, whereas within palynology both pollen and non-pollen palynomorphs were considered. Because the inherent complexity in the functioning of natural systems is behind the interaction among different compartments of ecosystems (i.e., biosphere, lithosphere, hydrosphere and atmosphere), the combined use of geochemistry and palynology enabled us to obtain a more integrated overview of past environmental changes beyond what would have been possible by any of these disciplines independently. Knowing the past evolution of ecosystems at large enough temporal scales is crucial to understand their dynamic and functioning, hence, this knowledge should be considered when implementing present-day environmental policies.