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CLIMATIC INFLUENCE ON PALEOGENE VEGETATION DYNAMICS AS EVIDENCED FROM ORGANIC PETROLOGICAL AND GEOCHEMICAL DATA FROM BULGARIAN COAL DEPOSITS

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Five Bulgarian coal deposits, spanning in age from Early-Mid Eocene to Late Oligocene (Figure 1), were studied for their organic petrological and geochemical characteristics. The results indicate that the Eocene coals are predominantly composed of fine detrital organic matter (detrovitrinite/detrohuminite), denoting contribution of plants with poor preservation potential, whereas the Oligocene coals contain significantly more telohuminite due to the abundance of woody tissues, often having suppressed huminite reflectance because of resin impregnation of the tissues. The Di-/(Di-+Tri-)-terpenoid ratio is very low (0.0 – 0.2) for the Eocene coals and gradually increases to reach 0.98 – 0.99 for the Late Oligocene coals. Although peat-forming environmental settings have played certain role in organic matter transformation during the peatification, these results fit very well to the established palaeobotanical shift from angiosperm-dominated palaeotropical hygrophytic/hygromesophytic palaeocoenoses to gymnosperm-dominated arctotertiary mesophytic/mesoxerophytic palaeocoenoses (Bozukov et al., 2009) and further indicate a gradual shift towards cooler and drier climatic settings over the Paleogene. Thus, the organic petrological and geochemical data can successfully be used to infer vegetation dynamics and climatic shifts in cases where palaeobotanical and palynological data are scarce or missing.

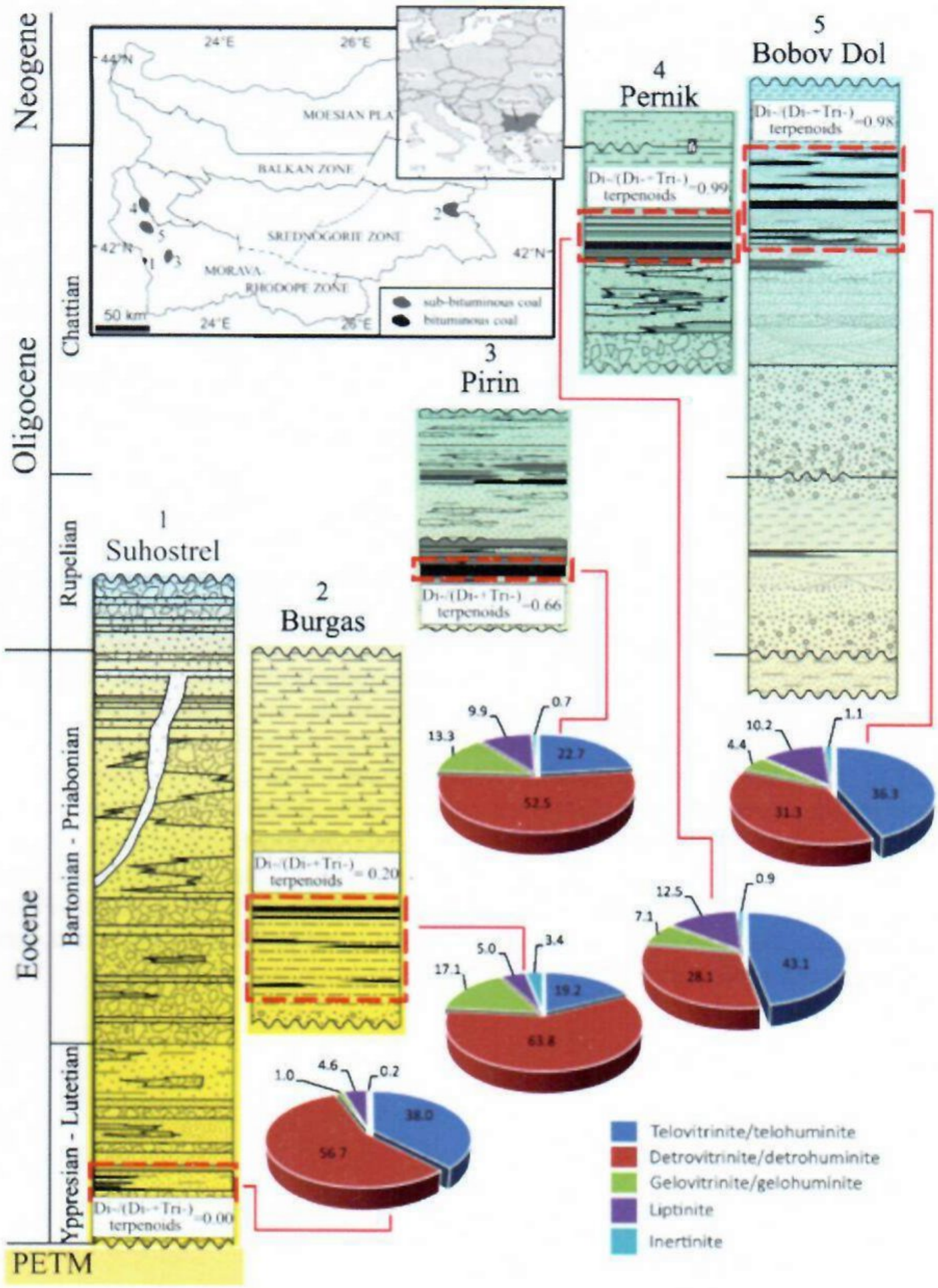

Figure 1. Lithological profiles of Bulgarian coal deposits (lithological symbols after U.S. Geological Survey, 2006) displaying changes in coal's petrographic (in vol. %) and organic geochemical characteristics during the Paleogene. Color coding follow the change from very warm temperate climate during the Eocene to warm temperate climate with cooling trend during the Oligocene (Bozukov et al., 2009).

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