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Palaeohydrological and palaeoecological studies on South Cameroonian alluvial sedimentary basins – New evidence on the palaeoenvironmental evolution of western Central Africa since the Late Pleistocene

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A new valuable and innovative contribution will be presented to ascertain the timing and extension of climatic and ecological changes in western equatorial Africa. Main focus is laid on the dynamics of climate, fluvial systems and the high sensitive tropical ecosystems (dense evergreen and semi-deciduous rain forest and savanna-rain forest margin) since the Late Pleistocene (∼50 kyrs. BP). For this purpose extended fieldworks were carried out in South Cameroon (2004-2008) by the ReSaKo-Project (sub-project of DFG-Project 510) with abundant investigations on alluvial sedimentary basins of equatorial tropical fluvial systems. Suitable alluvial sediment-archives for palaeoenvironmental research were uncovered along selected braiding, meandering and anabranching/anastomosing reaches of major southwestern, into the Gulf of Guinea (Ntem, Nyong and Sanaga) and southeastern, into the Congo basin (Boumba, Dja and Ngoko) draining rivers (RUNGE et al. 2006, SANGEN 2008). Among geomorphological investigations and cross section discussions, 150 corings (Edelman, 20 cm layers) reaching maximum depths of 550 cm were carried out on river benches, levees, cut-off and periodical branches, islands and terraces as well as in seasonal inundated floodplains and backswamps. Corresponding sedimentary profiles and catenae recovered multilayered, sandy to clayey alluvia containing sedimentary form-units and palaeosurfaces which contribute to the reconstruction of palaeoenvironmental conditions in western equatorial Africa. Several (59) radiocarbon (AMS) dated samples (Erlangen and Lecce) from fossil organic layers and macro-rests embedded in these units yielded Late Pleistocene to recent ages (^{14}C-ages around 48 to 0.2 kyrs. BP), spanning also the Last Glacial Maximum (LGM) and Holocene record. Abrupt grain-size modifications and alternating form-units (sandy and clayey layers, palaeosurfaces) in the stratigraphic records display fluctuations in the fluvial-morphological response of the fluvial systems to climatic variability and other extrinsic and intrinsic impacts. Although the sedimentary record varies among the studied river reaches, fossil organic sediment layers (palaeosurfaces) containing valuable proxy data were found in almost all alluvia basins of examined southern Cameroonian rivers. Around 56 δ^{13}C-values corresponding to the dated samples (-31.4 to -18.0 ‰) evidence that despite major disturbances of the African rain forest over geological times (MALEY 2001) mainly rain forest ecosystems have prevailed during the corresponding time periods, presumably as gallery forests, which were able to persist in this fluvial habitat ("fluvial refuge"), even during arid periods (e.g. LGM). The results are consistent with earlier findings from lacustrine (SERVANT & SERVANT-VILDARY 2000), marine (WELDEAB et al. 2007) and additional sediment archives (GASSE et al. 2008) and will add additional insights and information to the unravelling of the complex respond of the African monsoon, the Central African ecosystems and fluvial systems to Late Quaternary climatic and environmental fluctuations within a globally teleconnected system.

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