Terrestrial palaeoecosystems of large mammals from the Early Oligocene to the Early Miocene: biodiversity, biogeochemistry and biotic/abiotic events.

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The global European climate is subjected to severe climatic changes between the Early Oligocene and the Early Miocene. While the Late Eocene was characterized by a tropical climate, an aridification linked to an increase of the seasonal contrasts can be observed in the Early Rupelian (Oligocene), after the "Grande Coupure" event at the Eocene/Oligocene boundary. From the Late Rupelian to the Chattian, the humidity increases and the climate is quite stable, just showing a slight decrease in temperature. In the latest Oligocene, the still rather warm and wet conditions evolve rapidly to a colder and drier climate, leading to the Oligocene/Miocene climatic crisis (Berger 1990, 1992). In the Aquitanian (Early Miocene), the climate again becomes warm and humid, and remains stable during the Burdigalian. According to Becker (2003), it seems that the temperature increases quickly whilst the humidity rises progressively until the Proboscidean Datum (Early/Middle Miocene boundary).
All these changes influence the faunal and floral evolution. The European large mammal biodiversity testifies important modifications. For example, some ungulates show changes in their body mass, probably linked to environmental changes. The climatic stress during the Oligocene and the Early Miocene leads to changes in the diversity of the perissodactyls and artiodactyls. Furthermore, the observed faunal turnover at the end of the Oligocene (MP29-30) and at the beginning of the Miocene (MN1) seems linked to the Oligocene/Miocene climatic crisis described by Berger (1990, 1992).
Using the palaeontological data set of the European large mammals, and based on the work of Engesser (1990, 1997) on small mammal biostratigraphy of the Swiss Molasse Basin during the Paleogene and the Neogene, the present study aims to understand and characterize the climatic and environmental changes before, during and after the Oligocene/Miocene boundary, to analyse the large mammal faunal turnover at the end of the Oligocene and at the beginning of the Miocene, and to define the existence of the biotic and abiotic events of this period.
A special focus is set on decisive large mammal genera of the Oligocene and Early Miocene, and also on lineages present throughout the Oligocene/Miocene boundary (Fig. 1): *Ronzotherium*, *Diaceratherium*, *Menoceras* and *Pleuroceros* (Rhinocerotidae, Perissodactyla, Mammalia), *Eotapirus*, *Paratapirus* and *Protapirus* (Tapiridae, Perissodactyla, Mammalia), *Anthracotherium* and *Microbunodon* (Anthracotheriidae, Artiodactyla, Mammalia), *Cainotherium* (Cainotheriidae, Artiodactyla, Mammalia), *Propalaeochoerus* and *Palaeochoerus* (Tayassuidae, Artiodactyla, Mammalia) and *Amphitragulus*, *Dremotherium*, *Bedenotherium*, *Pomelomeryx*, *Hydropotopsis* and *Oriomeryx* (Moschidae, Artiodactyla, Mammalia).
The different palaeoecological parameters (body mass and size, slenderness, locomotion and diets) will be estimated using similar living species. Biogeochemical analyses (carbon and oxygen isotopes of skeletal apatite) will be applied on

herbivorous mammal tooth enamel in order to estimate the palaeotemperatures. These biogeochemical data will be compared with complementary analyses on reptile remains (turtles and crocodiles).

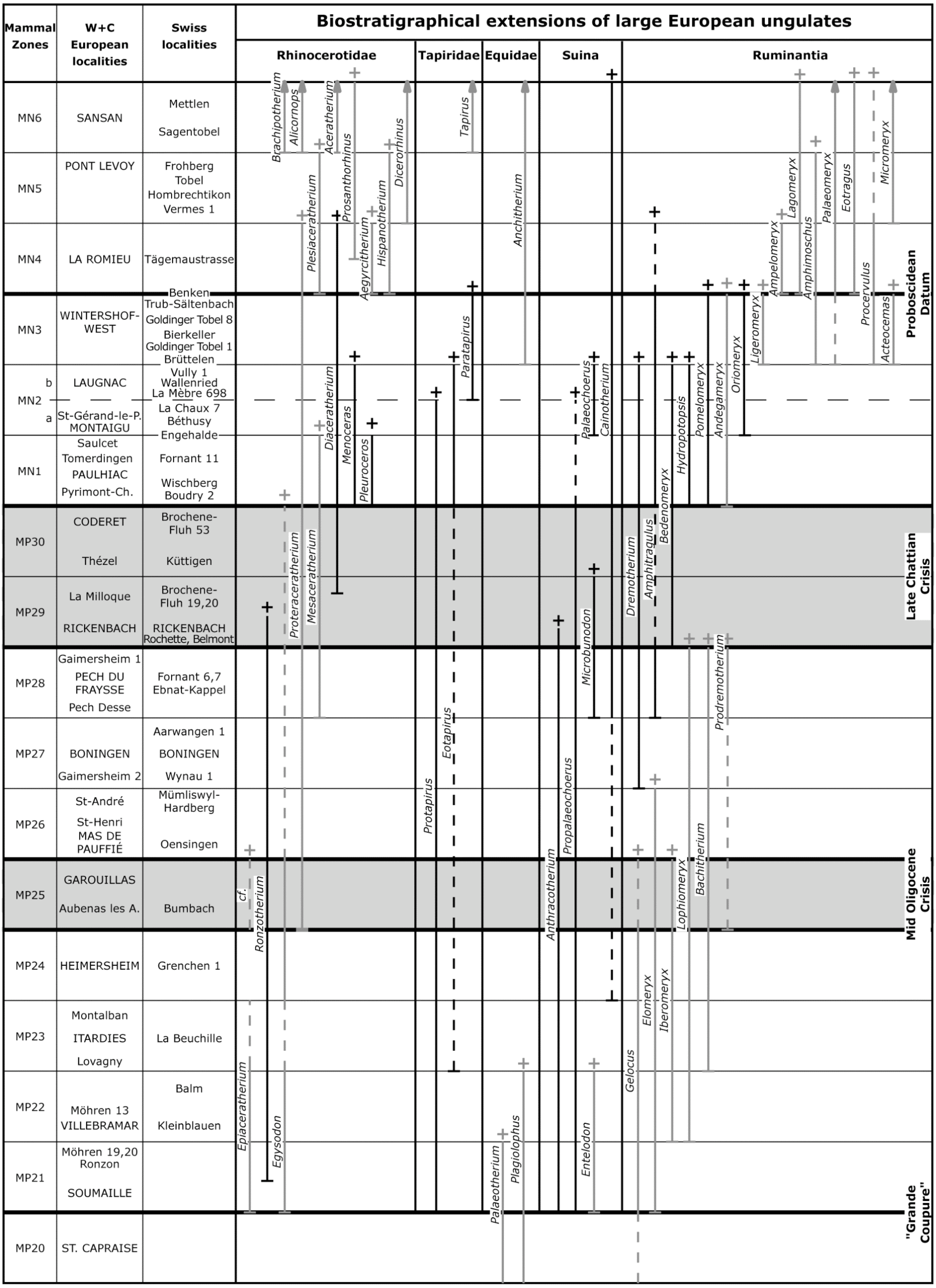

Fig. 1: Biostratigraphical extensions of large European ungulates; black arrows: decisive genera.

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