Sensitivity of Population Dynamics to Life History Parameters: An Individual-Based Simulation Study for the Fat-Tailed Dwarf Lemur *(Cheirogaleus medius)*

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Key Words: Computer simulation • Population dynamics • *Cheirogaleus medius* • Survival probability • Habitat destruction

Time or feasibility limitations of field studies often prevent researchers from making reliable predictions about population dynamics in the face of changing ecological conditions. However, combining field data with computer models can overcome these problems and help to understand how population dynamics develop and which variables are influencing them most. In this study, we designed an individual-based model to analyse how changes in ecological conditions, as found in the case of habitat destruction or the introduction of non-indigenous predators, possibly affect the population dynamics of the fat-tailed dwarf lemur *(Cheirogaleus medius)*. Variables for this model were derived from an extensive long-term field study (1995–2001) on the life history and population dynamics of *C. medius* in Kirindy forest, Madagascar. Using the data from the field study (rates of mortality, dispersal, birth and reoccupation of territories) the model predicts a stable population of *C. medius*, as is indeed found in the field. Changing key parameters of life history, the simulations of this model reveal that *C. medius* populations are quite sensitive with a distinct threshold towards extinction for some parameters (e.g. reduction of forest size and offspring survival rate, increasing predation pressure), whereas others show no effect in the model (e.g. birth synchrony). This study shows that computer based simulation can be a valuable tool to assess the quality of the collected field data and the resulting assumptions. Furthermore, it can help to predict the development of population dynamics and other biological variables under constant as well as under changing conditions.

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Sex Skin Swellings in Wild West African Chimpanzees *(Pan troglodytes verus)*: A Reliable Indicator of Ovulation?

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Key Words: Chimpanzee • Sexual swellings • Hormone analysis • Ovulation

Sexual swellings advertise sexual receptivity in females of a number of Old World monkey species. Several hypotheses that explain the function of this conspicuous trait are based on assumptions about the temporal relation between the period of maximum swelling and ovulation, and remain largely untested. By combining non-invasive urinary progeston analysis with observational data on swelling characteristics, we examined the reliability of sexual swellings as an indicator of the timing of ovulation in free-living chimpanzees of the Taï National Park, Côte d'Ivoire. Our results show a high variability in the length of the maximum swelling period. Furthermore, although ovulation was almost entirely restricted to

the second half of the period of maximum tumescence, its timing varied considerably in relation to both the onset and the end of the maximum tumescence phase. The probability of ovulation, however, was not random, but peaked on day 7 after the onset of the maximum swelling phase, and was almost 60% between days 7 and 9. We therefore conclude that, in chimpanzees, perineal swelling indicates the probability of ovulation, but does not provide sufficient information to deduce its exact timing.

Signal Combinations in Hamadryas Baboons *(Papio hamadryas hamadryas)*

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Key Words: Communication • Intentional signals • Hamadryas baboons • Visual signals • Tactile signals

Fourteen focal animals of a group of about 35 hamadryas baboons were observed in Leipzig Zoo from April to October 2000. The aim of the study was to investigate their visual and tactile communication. We understand communication as the 'indirect' achievement of a goal via information conveyed by means of signals from the sender to the recipient (without physical power). We were especially interested in intentional signals. Intentionality can be assumed if there are flexible relations between signal and goal as well as special sensitivity by the sender to the social nature of the signals. Flexibility can also be investigated by the number of different ways in which a baboon combined its single signals**.** The animals used 19 out of the 26 different visual and tactile signals we recorded for combinations (grouped into four categories): eight 'visual signals' (out of 13), five 'visual signals possibly making some noise' (out of six), two 'visual signals often combined with touching' and four 'tactile signals' (out of five). Most common were combinations composed of 'visual signals' and 'visual signals possibly making some noise' as well as pure 'visual' combinations. The occurrence and the frequency of the signals in the different combinations will be demonstrated. Twenty-seven different combinations (25 double and 2 triple) were analysed regarding occurrence and frequency as well as usage by the focal animals. The highest number seen in a focal animal was 12 different combinations (harem leader) and the lowest three (infants). The data were also analysed for age and sex classes.

Molecular Evolution of FOXP2, a Gene Involved in the Development of Speech and Language

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Language is an uniquely human trait that probably represents a prerequisite for the development of human culture. It has become clear in recent years that aspects of speech and