# PRIMATE COMMENSALISM

Jean-Pierre GAUTIER and Sylvain BIQUAND

Primatologists are usually faced with the dramatic reduction of wild primate populations occurring with the depletion of tropical rainforests. But the impact of man proves sometimes positive on primate demography, and in some cases primate populations could adapt and expand fastly leading to local overpopulations creating conflicts with people.

We define here commensal populations as the primate populations taking advantage of human food, waste or crops to supplement their diet or as their main food source. Commensal populations have been described in various species. Following the symposium held during the XVth Congress of the International Primatological Society in Strasbourg 1992, this publication considers the Indian Rhesus macaque (Southwick and Siddiqui, Malik and Johnson), the Crab-Eating macaque (Wheatley), the Tibetan macaque (Zhao), the gibbons (Eudey), the Barbados vervets (Horrocks and Baulu), the baboons in Africa and Arabia (Strum, Biquand *et al.,* Boug *et al.*).

Macaques and baboons exploit successfully the human environment and extensive reports will be provided in this publication ; as a basis for a comprehensive approach to commensalism we will use here examples from a broader range of species including the African forest species.

The study of commensal groups has two justifications. First we have to find appropriate solutions to remedy the conflicts with people in a conservation conscious manner. Indeed human intervention is often needed because commensal populations tend to escape the regulation by natural factors such as food availability and predators. However, the study of commensal primates has also a fundamental interest ; commensal populations exemplify an extreme reaction to human disturbance, and should be considered in a gradient of human impact on wildlife. This gradient ranges from destruction to apparent benefit, according to the local conditions and to the biology of species.

The primary factor allowing the development of commensalism is the large dietary flexibility of primates. This is expected from generalists such as baboons, but can also be observed in species considered as specialists. In Zaire, cercopithecines species, feeding habitually on pulpous fruits could exploit such resources as seeds and flowers' nectar when the habitat does not provide fleshy fruits (Gautier-Hion and Maisels, 1994). Dietary specialization is not strict in most primates, even if they possess specialized digestive tract such as colobus monkeys which are folivorous in East Africa and granivorous in Central Africa (Maisels and Gautier-Hion, in press ; McKey *et al.,* 1981). Many species could switch easily to new food sources, natural or artificial. This explains the evolutionary success of

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primates as well as their ability to exploit man modified environments. However, when modifying the natural environment, humans often promote one or several species, for which the change is neutral or even positive. In the same time, diversity is reduced due to disappearance of the less adaptable species. In the Gabonese forest, the small Cercopithecinae species *C. cephus* finds in the secondary forest a better shelter than in the primary. The recently discovered *C. (lhoesti) solatus* is less affected than others by the disappearance of the primary forest and is frequently found around villages although readily hunted and killed by gun or trap (Gautier *et al.,* 1992). Secundarization also means a change in plant species composition, providing new food sources to primates, Gorillas (*Gorilla gorilla*), as well as elephants, are able to use these sources in Gabon (McShane, 1993). In Asia, the Bornean *Macaca fascicularis* thrives on secondary forests (Wheatley, 1980). Finally, if these new resources are complemented by human crops, a secondary environment becomes suitable to sustain the fast growth of certain primate populations. We found the groups of *Cercopithecus talapoin* around villages in Gabon to be twice as large as groups living in the wild. In this case the talapoin benefits from its link with swamp forest and exploitation of the cassava left to soak in fresh water (Gautier-Hion, 1971).

This differential impact is also found in hunting. Hunters preferentially seek the larger species and near Gabonese villages the abundance of Cercopithecine species was inversely correlated with their weight (Gautier and Gautier-Hion, 1969). Indirectly, in Saudi Arabia, the destruction of predators allowed the fast expansion of Hamadryas populations, by removing wolves, hyenas and leopards (Biquand *et al.,* 1992).

One of the fundamental factors in the genesis of commensalism is the cultural attitude of people towards primates. Tolerance, acceptance or even demand of interactions with primates varies with the cultural context ; in Africa and Asia ethnic taboos locally protect certain species. Nevertheless, changing economic needs and means also affect the status of primate species ; the Gabonese talapoin, once protected by its small size, now became a prey species due to the rarity of larger game species.

We would also like to introduce the time factor in the study of commensalism, taking into account the span of time allocated for adaptation to human disturbance. We indeed have to take into account such different cases as the sudden adaptation required to changes occurring with urbanization or deforestation and the long term adaptation of Indian Rhesus to human environment. This time factor could be discussed at the population, species and community level.

Temporary influences of human activities, restricted in time and space, will progressively be buffered and the ecosystem will return to its prior state. Such restricted perturbations (local fire, temporary track) appearing here and then create local differentiations exploited by certain species as they occur.

Permanent modifications of the environment by man imply adaptation of the wildlife communities, and a new ecosystem balance is established. This is the case where cultural relationships developed between people and primates.

Finally the contact with man could be even more ancient. Interactions between man and non-human primates are then not of a cultural nature but resort from the biology and co-evolution. For example, the impact of human activities has been considered in the speciation of the Asian macaques, certain species could be called « weed species », flourishing in the steps of man (Wheatley, 1980 ; Richard and Goldstein, 1981).

We wish the general reflections on the different levels of human influence developed above could guide understanding of multiple determinants of the more extensive commensal situations we will hear about in these symposium. We should drive out what is common to these cases, and the gathering of various experiences will hopefully result in a better understanding of human-primate relationships, and offer renewed prospects for the management of conflict situations.

## REFERENCES


BIQUAND, S., BIQUAND-GUYOT, BOUG, A. & GAUTIER, J.-P. (1992). — Group structure in wild and commensal hamadryas baboons : a comparative study in Saudi Arabia. *Int. J. Primatol.,* 13 : 533-543.

GAUTIER, J.-P. & GAUTIER-HION, A. (1969). — Les associations polyspécifiques chez les Cercopithecidae du Gabon. *Rev. Ecol. (Terre Vie)* : 164-201.

GAUTIER, J.P., MOYSAN, F., FEISTNER, A.T.C., LOIREAU, J.N. & COOPER, R.W. (1992). — The distribution of *Cercopithecus (lhoesti) solatus.* An endemic guenon of Gabon. *Rev. Ecol. (Terre Vie),* 47 : 161-174.

GAUTIER-HION, A. (1971). — L'écologie du talapoin du Gabon. *Rev. Ecol (Terre Vie),* 2 : 427-490.

GAUTIER-HION, A. (1983). — Leaf consumption by monkeys in western and eastern Africa : a comparison. *Afr. J. Primatol.,* 21 : 107-113.

GAUTIER-HION, A., BOURLIÈRE, F., GAUTIER, J.-P. & KINGDON, J. (eds) (1992). — *Primate radiation, evolutionary biology of the African guenons.* Cambridge University Press, Cambridge.

GAUTIER-HION, A. & MAISELS, F. (1994). — Mutualism between a leguminous tree and large african monkeys as pollinators. *Behav. Ecol. Sociobiol,* 34 : 203-210.

MAISELS, F. & GAUTIER-HION A. (in press). — Why are Caeesalpinioideae so important for monkeys in hydromorphic rainforests of the Zaire basin ? *In :* Raven, P. H. & Polhill, R. (eds), *Advances in Legume Systematics.*

MCKEY, D.B., GARTLAN, J.S., WATERMAN, P.G., CHOO, G.M. (1981). — Food selection by black Colobus monkeys (*Colobus satanas*), in relation to plant chemistry. *Biol. J. Linnean. Soc.,* 16 : 115-146.

MCSHANE, T.O. (1993). — Conservation without myth. *In* Jonathan S. Adams & Thomas O. McShane (eds), *The Myth of Wild Africa — Conservation without illusion :* 207-226. Norton Publisher.

RICHARD, A.F. & GOLDSTEIN, S.J. (1981). — Primates as weeds : the implications for macaque evolution. *Amer. J. Phys. Anthropol.* 54, 2, 267.

WHEATLEY, B. (1980). — Feeding and ranging of East Bornean *Macaca fascicularis. In* D. Lindburg (ed) : *The Macaques : studies in Ecology, Behavior and Evolution :* 215-246, Van Nostrand Reinhold Company.