



Quarterly Report

Mona Monkey Reintroduction Project

Internal Report, January 2008

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The release of 3 Mona monkeys (*Cercopithecus mona*) into a protected forest in Cross River State, Nigeria, took place on the 1st of November 2007. Since that time, CERCOPAN research team has followed and monitored the group on a daily basis, from dawn to dusk. Continuous observation and data are sampled on each of the members of the group, using group scan sampling and individual focal sampling (Altmann, 1974). This report presents the preliminary results on the analysis of activity budget, habitat use and diet for the 3 first months of monitoring, as well as supplemental information concerning group movements, food provisioning and medical treatments. The 3 individuals remained together as a group since the beginning, showing no trend for an individual immigration, so we can analyse the observation on the group scale. No death or major injuries have occurred.

General

From the 2nd of November 2007 to the 25 of January, the monas have been followed daily without exception, for a total of 85 days.

Every day, the group is monitored from 6:00 am to 6:30 pm. This rhythm allows us to be able to find easily the group in the morning and to have full days of observation. Data sampling consists on 15 min interval scan sampling (48 to 50 scans per day) and 10 min continuous individual focal sampling every hour (120 min per day).

A 4-person team forms the research group, with one lead researcher and 3 research assistants. A back up research assistant is also being trained in observation and monitoring techniques.

The two adult monkeys are still equipped with radio collars which are functioning well. Both individuals seem to have been habituated to the collar, and don't show any adverse behaviour towards it (intensive scratching, large amount of time spent to manipulate the collar).

Home-range size and day length range

Using a grid system that has been established inside the forest on the release site, we are able to measure and assess the size of home-range as well as the daily travelled length. After 3 months, the approximate home-range size is between 7 and 8 ha, and the daily length range is 750m. The 2 first months were characterized by a small home-range size and daily length range (2,5 ha for 350m per day), since the group was located in part of the forest rich in food resources, especially fruits. Then, the production of there top 3 food species has decreased, and we could observe an increase of the time spent travelling.

The group has always stayed inside the Core Area, no individual has gone in the research area, or community forest, or main camp. The place the group is located is in the middle west of the Core Area, not far from the release enclosure emplacement.

The group owns several sleeping trees they leave in the morning and that constitute central points around which the monkeys travel and move during the day.

Food provisioning

We adopted a policy of post release support, as recommended as a key to success in the literature. In line with this policy we initially provided supplemental food, using high calorie fruits; provisioned food (average 1kg; edible weight 550g for entire group) is bananas, coconut or papaya. We usually give only one type of food for each provisioned day.

During the two first weeks, we supplied the group twice daily with food, once in the morning and once in the late afternoon. Since the group did not spend time around the release enclosure where food baskets were set up for provisioning, the research team supplied food directly to the group. After two weeks, provisioning was decreased to once daily, usually in the early afternoon. The reasons for this decrease were 1) we observed the group could find enough food and fruit on their own, and 2) to reduce the proximity between human and the monas. This provisioning regime was carried out for one month and a half, when it was further reduced to once daily, every 2-3 days in early January 2008. This new reduction is part of the process of a progressive decrease in food provisioning, allowing the group to be more independent, and to further reduce human/monkeys interactions.

Health

In the course of December 2007, the 3 individuals were infected by ‘Tumbu’ flies (tiny larvae burrow under the skin and grow to large maggots). Again in line with post release support in the early stages of release, we decided to treat the monkeys, using Ivermectine 0.5mg/kg orally in provisioned food to stop the infections. This was successful and there have been no further infections.

No major injury has been observed-- although we did observe the youngest female to fall a distance of more than 10 metres she was uninjured. We have weighed the male twice, and it seems this individual has not shown any substantial weight change since his release. The technique used to weigh these free monkeys is not accurate, but it's a non invasive technique that avoids any capture or human disturbance. The principle is to observe an individual sitting on a thin shrub or sapling, flexing this branch on a horizontal plan, then to take a mark on the height the shrub top has reached, record the position along the trunk the monkey is sitting, and to mimic the weight necessary to flex the branch to the position flexed by the monkey. These measurements are not systematic but give us a good indication of the general health condition.

Activity budget

Using the 3 first months of scan data, the overall activity budgets of the group and for each individual are shown in Figure 1. The categories of activity considered are resting, travel (movements between two points without feeding bouts), feeding (process, chew, swallow, look for and manipulate food items), socializing (affiliate and agonistic intra-group interactions) and others (vigilance and

calls). To analyse activity budgets, we calculated proportions based on the number of time-points records for each activity divided by the total number of activity records subdivided by individual.

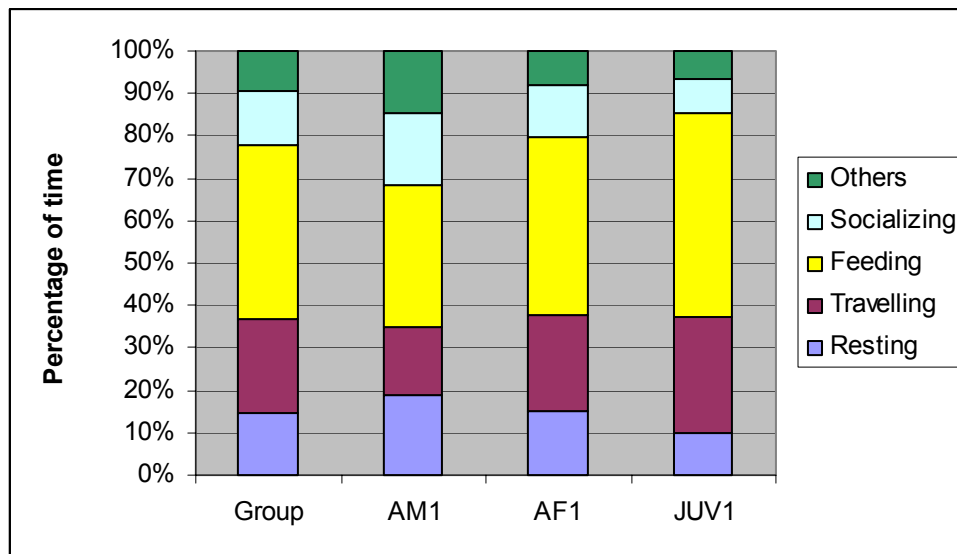


Fig 1: Activity budget of the mona released group during the first trimester.

AM1: adult male ; AF1: adult female ; JUV1: sub-adult female

The main activity for each individual is feeding (41.4% of the time for the overall group), followed by the time devoted to the travel and movements (22% of the time). Resting and socializing account for 14.5% and 9.4% respectively. No data concerning activity budgets and daily patterns exist for wild *Cercopithecus mona* as well as for close related species from the mona group (*C. campbelli* and *C. pogonias*), so comparisons are difficult. However, the activity patterns shown by the mona group are close to what is found for other Cercopithecine species (Clutton-Brock & Harvey, 1997; Tashiro, 2007).

It's interesting to notice that the pattern shown by the adult female is the closer to what is found when the data are analyzed on the group scale. The adult male spends more time in 'resting' and 'others' categories and less time is spent feeding and foraging than the group mean and the adult female. It is possibly due to the more important role of the male in vigilance and anti-predator behaviours, reducing the available time for other activities.

Habitat use

We recorded the forest stratum occupied by each individual on each activity record, allowing us to analyse the habitat use and forest level occupation patterns. The categories used are 0: ground; 1: shrubs and sapling layer; 2: understory layer; 3: canopy; 4: emergent. The results for the first quarter are given in Figure 2.

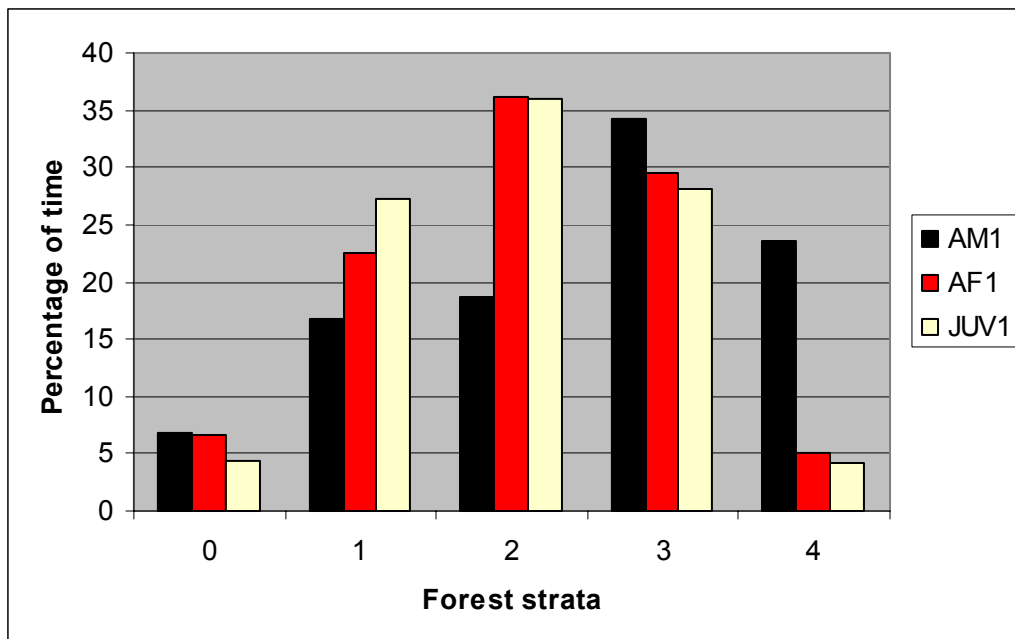


Fig 2: Percentage of time spent in the different forest stratum by the released individuals. AM1: adult male 1; AF1: adult female 1; JUV1: juvenile 1

There are clear sexual differences, with the male spending more time in the higher levels male and the females spending more spent in the intermediary levels. The habitat use shown by this group is close to what has been for other Cercopithecines species (Bitty & McGraw, 2007; McGraw, 2002), with a similar pattern to *Cercopithecus diana* (Bitty & McGraw, 2007). Every level is occupied and it confirms the general assumption that guenons are characterized as generalized arboreal quadrupeds (Fleagle, 1999).

Diet

Diet composition is studied by recording the type of food item that is processed, ingested or manipulated, for each activity record corresponding to a feeding activity. Even if an exhaustive list of food item is available, the next table presents the relative proportion of the main categories of food in the diet of the released monkeys.

Fruits/Seeds	Leaves	Invertebrates	Provisioned	Other
28.31%	8.35%	57.73%	4.70%	0.88%

Table 1: Relative proportion of time spent feeding each category

Provisioned food accounts for less than 5% of the total time spent feeding. They spend the most time, surprisingly, feeding on arthropods. This is similar to what was found by Tashiro (2007) for *Cercopithecus mitis* and *Cercopithecus lhoesti* in the Kalinzu forest, with more than 50% of the feeding time devoted to invertebrates. The second main food item is fruits and seeds combined, which represents a larger *volume* per food intake than invertebrates. This mainly frugivorous diet is similar to what is found in other Cercopithecine species (*C. pogonias* Gautier-Hion, 1980; *C. campbelli* McGraw 2002).

The effect of the supplementing food is difficult to assess, but it seems to be weak, as the group's diet is similar to that of other related species.

Conclusion

Three months after the release of 3 mona monkeys, no loss of any individual, the group has stayed in the area that was planned to be the home-range of the group and was studied to assess its sustainability for a monkey group. Food provisioning is carried out, but with a process of progressive decrease of the provided amount. The radio tracking system is still working, and no major health problems have occurred.

The activity patterns and habitat use is similar to other Cercopithecines species, which show the relatively good adaptation of the group to their natural habitat. There is no excessive time spent on the ground, despite their long time in a traditional small enclosure, and when they do go to the ground it is devoted to foraging activities. The group show a pattern of generalized arboreal frugivory as we would expect.

The diet is interesting because of the large time spent foraging for and consuming invertebrates, also recently demonstrated by Tashiro (2007). Although most studies on Cercopithecines have demonstrated less dependence on Arthropods, Chapman et al. (2002) suggested that differences in diet are sometimes greater among study sites than among species. Primates can change their food habits according to both habitat (Bourlière, 1985) and season, and this flexibility seems to be the case for this mona individuals.

The monas also have not shown any tendency at all to move close to areas of human activity (e.g. the enclosure where they were previously fed or the main camp, both of which are within range), nor any tendency to gravitate towards existing farmland on the edge of the protected area. For the most part they also ignore their human observers. This is very encouraging for future releases, alleviating any fears that rehabilitated formerly captive individuals might be too 'humanized' for successful reintroduction, or gravitate towards ready food supplies.

We can conclude that the release so far is a success and that the monkeys show a natural pattern and an adaptive ability shown by their dietary flexibility.

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