

Seventeen black howler monkeys (*Alouatta caraya*) from three separate 'montes' in Reserva Don Luis, Esteros del Ibera, were observed for a total of fifteen hours. Using time sampling, the behaviour of the howler monkeys was recorded every minute for one hour periods. These observations took place for three weeks in September 2013.

The present study had no specific hypotheses as its aim was to obtain and present a wide range of data concerning howler monkey behaviour. Below are the findings of the study.

### **The three groups**

*Montecasa* – This group consists of two males, three females and one juvenile. One male is larger than the other and is most likely dominant. This group seem to be the quietest and least disturbed by the presence of humans, this is most likely due to the fact that they live in close proximity to a house and therefore experience the noise and impact of humans more than the other two groups.

*Montegrande* – In Montegrande there appears to be at least two groups of howler monkeys, the present study focuses on just one of these. This group are the loudest and most disturbed by human presence, they are two males, two females and two juveniles. At the beginning of the observation one juvenile would stay on its mother's back, but it soon became old enough to climb in the trees by itself, albeit staying near its mother.

*Montemano* – This group is made up of one male, two females and two juveniles. One juvenile originally spent its time on its mother's back then, like the juvenile in Montegrande, became old enough to climb alone. Although this group were never too concerned by human presence, they hid the young juvenile from view and the mother was by far the most vocal towards humans, presumably to protect her young.

### **Response to threat**

When feeling threatened subjects would climb up a high tree, both to move away from the threat and keep it in sight. The only other defence mechanisms they have are howling (males), grunting (males and females) and defecating on or near the threat (males and females).

It became very clear that the groups of howler monkeys differed in terms of how much they howled and grunted at people. Those in Montecasa seemed to be less vocal than either of the other groups and those in Montegrande were the most vocal. The average time that monkeys in each group howled or grunted at the observer was calculated and the results are displayed in Figure 1.

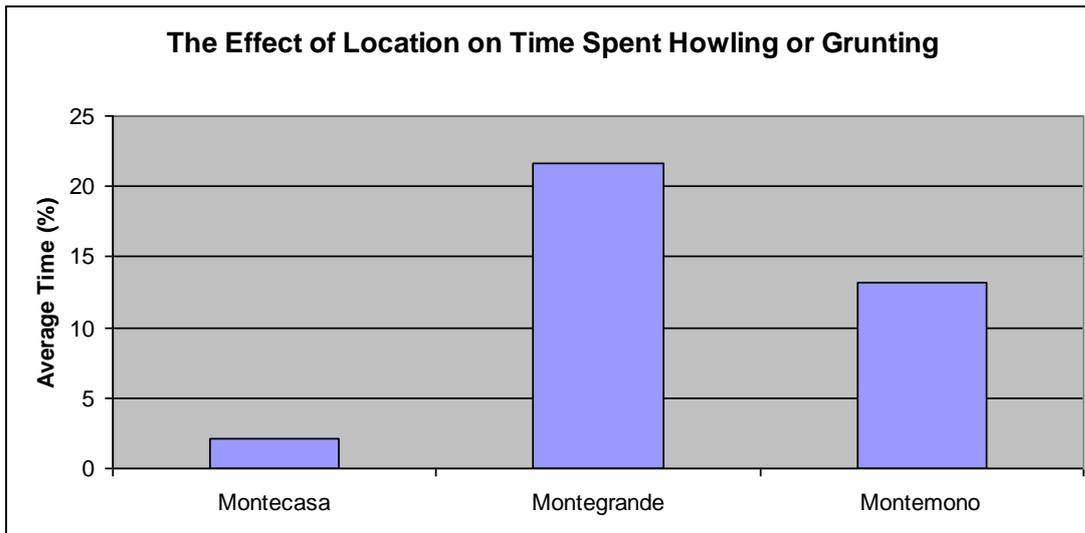


Figure 1. The average percentage of time that howler monkeys in each group spent howling or grunting.

It is clear that the monkeys in Montecasa spent much less time howling or grunting than did their counterparts in Montemono and Montegrande. This may be due to the fact that the monkeys in Montecasa are more comfortable around humans, so feel less threatened and so are less vocal. Howler monkeys in Montegrande made the most noise in response to humans; this could be due to the fact that they, like those in Montemono, rarely encounter humans. The difference in noise between the two latter groups could be because there are at least two groups of monkeys in Montegrande and therefore they have to be vocal to ward off rivals, making them more prone to vocalisations when threatened.

There seem to be a few gender differences in terms of vocalisations, the primary one being that only males howl. The howling of males seems to only last for a short period of time, then they resort to grunting or no noise at all. Females only grunt, but are more than willing to do so if they feel threatened. The average amount of time male monkeys from all groups spent howling and grunting was compared to the average time females from all groups spent grunting. The results showed no difference. However, under closer inspection it becomes clear that there are some gender differences to be seen. The results are displayed in Figure 2.

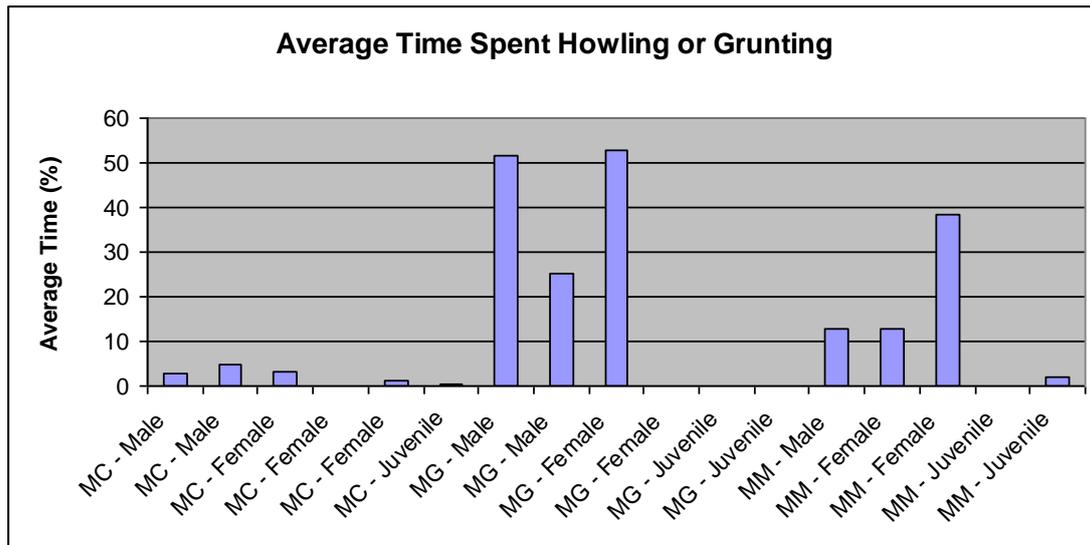


Figure 2. The average percentage of time all howler monkeys spent howling or grunting.

Figure 2 shows that, as previously mentioned, the monkeys in Montecasa are not vocal. Males in Montegrande and Montemono are vocal along with one female in each group, the other females and juvenile group members do not grunt at all. There are a number of possible reasons for this finding, one is that the vocal females are mothers of young monkeys –this is certainly the case for the Montemono female, but it is not clear for the Montegrande female– and are more vocal to keep threats away from their young. Another possibility is that each group has an alpha male and an alpha female, both of whom are vocal towards threats, whilst the other group members are quiet. This area clearly needs further investigation.

It is believed that the howler monkeys in Montecasa are quieter than the other two groups because they are used to human presence. Using this knowledge, one could draw the conclusion that the time monkeys spend howling or grunting will decrease as they get used to the observer. The average time monkeys in each group spent howling or grunting during each hour in the presence of the observer was calculated and placed in Figure 3.

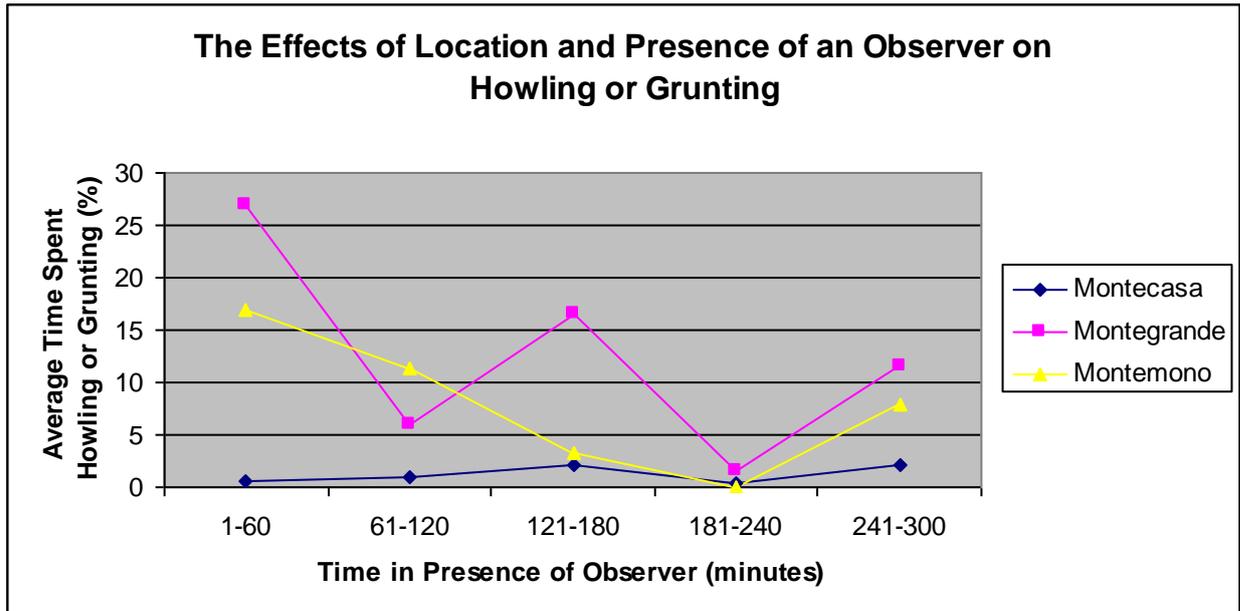


Figure 3. Average time monkeys in each group spent howling or grunting in each hour that they were in the presence of an observer.

Figure 3 is inconclusive, whilst howling and grunting from monkeys in Montegrando and Montemono decreased over time, this was not linear. To obtain more definitive results, this would need to be repeated or continued for a significantly longer period of time.

### Eating behaviour

The primary food of howler monkeys appears to be leaves, especially Tatane leaves. They did eat flowers, such as Lapacho flowers, at times and they may eat a lot of fruit and berries when ripe. However, during the present study almost all food eaten was leaves from large trees.

One would presume that there are no gender differences in time spent eating, this was calculated and males, females and juveniles all spend roughly the same amount of time eating. The time that monkeys in each groups spent eating was also calculated. The results are shown in Figure 4.

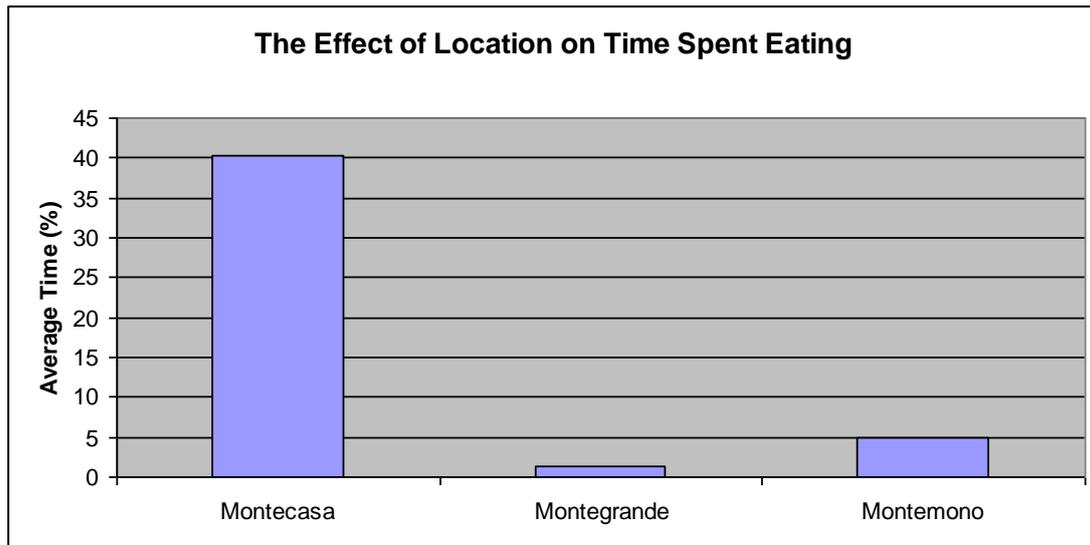


Figure 4. The average time that monkeys in each group spent eating.

Figure 4 very clearly illustrates that monkeys in Montecasa on average spend more time eating than those in Montegrande or Montemono. One reason for this could be that the monkeys in Montecasa are more comfortable around humans, so are happy to eat in their presence, but the others are not. Another possible reason is due to the hour that the study was conducted. Time of day was not controlled in this study, resulting in most of the visits to Montemono and Montegrande being in the early morning to early afternoon. The visits to Montecasa were at all times of the day, but two were in the late evening. From these two visits it became clear that subjects eat a lot from 5-6pm and then settle down to sleep as the sun sets. Therefore, Figure 4 may be disrupted by the time of day that each observation took place; a repeat of this finding is required when time of day is controlled.

### **Time spent climbing**

One observation made when the study was being conducted was that juveniles seem to be more inquisitive and do more climbing. This was investigated and it was found that, on average, adults spend 33% of their time climbing in comparison to juveniles who spend 40% of their time doing so. So juveniles spend more time climbing than adults, as suspected, however this may not be significant. The time that monkeys from each group spend climbing was also compared; this is displayed in Figure 5.

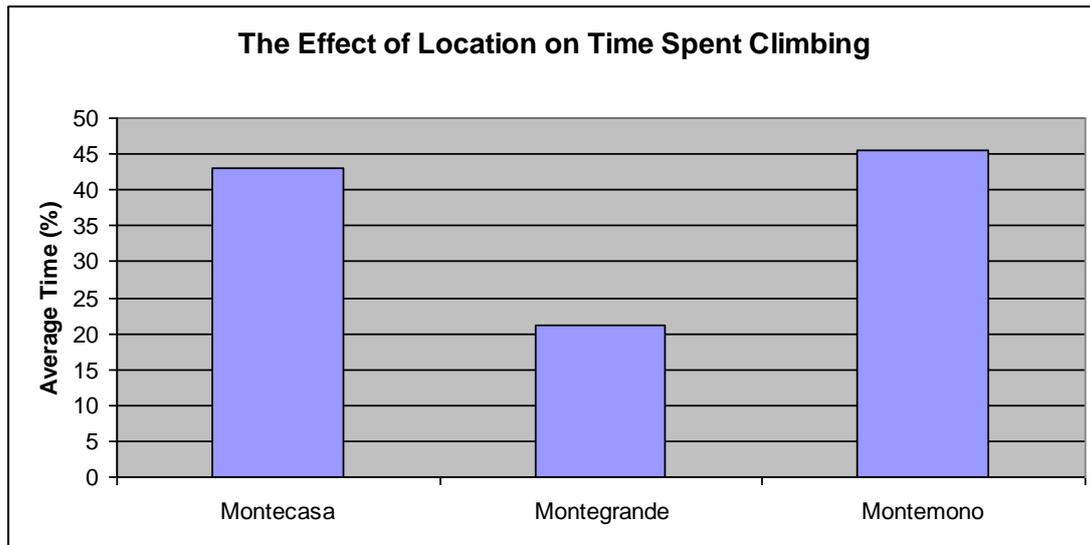


Figure 5. The average time that subjects in each group spent climbing.

Figure 5 clearly shows that subjects in Montegrande spent less time climbing than those in Montecasa or Montemono. One theory to explain this phenomenon could be that the monkeys in Montegrande spend more time sitting and watching the observer as they feel threatened, so climb less. However, those in Montemono climb a lot despite the presence of an observer. Therefore, if this result is significant, there is no clear explanation for its presence.

### Noteworthy observations

It was noted that subjects seem to defecate in the same areas. It is well known that a number of animals will do this, especially if they live in an enclosure and would otherwise be forced to live near their faeces, e.g. pigs, but it is quite strange that howler monkeys, an arboreal animal, seem to defecate in the same areas. This is the same for the monkeys in all three groups, so seems a common trait, but one which is quite difficult to understand.

Another surprising finding is the sheer lack of social interaction between subjects; it was extremely rare to see grooming taking place and even rarer to see any kind of play. Whilst they live in social groups and often sit near each other, it would seem that howler monkeys spend a lot of their time alone.

### Conclusion

In summary, the monkeys in all three groups act in very similar ways, but they do differ in terms of how they react to humans. The amount of time that they spend eating must be reinvestigated in a study controlling for time of day, and perhaps a larger sample.

The findings reported in this study have not been statistically analysed, so whilst they may be significant this cannot be concluded until such analysis is conducted.