

Summary

The social and ecological significance of nursery groups in wild giraffe

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Introduction

In general, immature individuals of the wild mammal are vulnerable to predation rather than adults because of its small size and weakness. Among mammals, therefore, there are several tactics to protect offspring from predation. Giraffe (*Giraffa camelopardalis*) calves also show high mortality rate. As an anti-predator strategy, several giraffe female–calf pairs gather to form a nursery group or crèche. However, there is only limited information on how giraffe females raise the young. To understand how animal rear their offspring in wild environment is important for conservation and to improve the captive condition. The purpose of this study is to reveal social and ecological significance of wild giraffe nursery groups by collecting quantitative data.

Materials and Methods

Field work was conducted in the Katavi National Park, Tanzania. The main vegetation type is miombo woodland which is a deciduous forest. Study object was Masai giraffe (*G. c. tippelskirchi*). The data was collected during four study periods, within the dry period: (1) June to October of 2010; (2) August to October of 2011; (3) June to November of 2016; (4) May to August and Oct to Nov of 2017, between 07:00 and 18:00. Observed individuals were categorized into the following four groups: 1. calf: <6 months; 2. juvenile: 6–18 months; 3. sub-adult: 18 months to 4 years; 4. adult: >4 years. I identified each individual by their pelage pattern on the neck. I recorded the locations of calving (where calf was located), nursing, and lying down (the last one was collected for individuals except female–calf). The habitat types were categorized into three groups: 1. Wooded grassland (WG), 2. Miombo woodland (MW), and 3. Open area (OA). Individual relationship was analyzed by the identification data of each herd membership which I encountered. While I followed nursery group, I also recorded the time duration of female–calf was separated. Additionally, I performed scan sampling of the calves every 10 minutes to record the identity of the nearest adult female to reveal if giraffe females share the role of guardian equally. The details of allosuckling behavior have been recorded for all occurrences.

Results and Discussions

Calving, nursing, and resting habitat selection

Calves were observed most of their time in MW and nursing events occurred only in MW. In addition, I recorded 50 cases of lying down episodes and those resting behavior was occurred in MW at the most. These results suggested giraffe preferred MW more than WG as a calving, nursing, and resting place. This may cause miombo woodland provides suitable place for avoiding heat gain and predation. Previous studies have suggested that giraffe females prefer open areas rather than other habitat types. However, this study provides new aspects of giraffe ecology that female–calf selected woodland as calving/nursing places rather than more open areas in my study area.

Individual relationships and social behaviors in the nursery groups

My results suggested that the females in miombo woodland rarely left calves for more than an hour and usually female came back to her calf's place after 40 min. That might be because the tree density in miombo woodland is higher than in acacia woodland where previous studies have been conducted. Therefore, females might not need to travel for a long time for searching food.

I found the females did not share the role of guardian equally. One possibility of this result was the difference in the frequency of nursing. If the calf is still young, female would need to nurse offspring more frequently than the other females. This may cause her not to go away but to stay with calves for most of the time.

I observed 5 allosuckling bouts, and 71 allosuckling attempts. Therefore, even if the occurrence rate is low, allosuckling can be occurred in the wild giraffe. This behavior might happen based on the milk theft hypothesis as like captivity. Because the allosuckler always joined a suckling pair and never succeeded when approaching a female by itself, and the female showed active signs of rejection when she noticed the allosuckler. In addition, I found that juvenile close to weaning showed the highest rate of allosuckling interactions. Therefore, I assume that the presence of a weaning individual might drive the occurrence of allosuckling in giraffe in the wild.

The dynamics of social bonding triggered by nursery groups

The results of social network analysis indicated the female's social relationships became stronger after gave birth. This suggests that the presence of calves influenced the relationships among the females. The strengthening of social relationships among female giraffe during the nursery period might help reduce calf predation by way of sharing calf care responsibilities while also enabling females to browse at remote locations.

Conclusion

I found that giraffe adopt their pattern of raising young according to the different environmental conditions and/or predation pressures. Therefore, the nursery groups might have function to raise offspring in an efficient way and also to reduce the risk of predation. Additionally, by forming this nursery group, some females could allocate more time for browsing while specific female take the responsibility of calf care. Also calves in this group have advantages of dilution effect. My data suggested that the nursery groups might important for providing an opportunity to build new social relationships among females/offspring. I highlighted the reproductive state and nursery group bonds were also in a variety of traits which are likely to influence the grouping a pattern of subunits in giraffe.