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Consistent fission-fusion dynamics across populations of Cape buffalo (Syncerus caffer caffer)

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Fission-fusion dynamics allow animals to flexibly balance costs and benefits of group living, and respond to changing environmental conditions by adjusting group size. Most studies on fission-fusion dynamics published to date focus on one population only, but little is known about the degree of variation in fission-fusion dynamics within the same species. In this study, we investigated the consistency of patterns and drivers of fission-fusion dynamics across three populations of Cape buffalo, in different protected areas in southern Africa (Hwange National Park and Gonarezhou National Park, Zimbabwe, Kruger National Park, South Africa). During 2008-2013, we tracked 54 adult female buffalos in different groups using GPS collars. We used GPS-tracking data to assess home-range overlap (HRO) and association patterns between individuals. We also investigated the temporal dynamics of fission-fusion events at daily and seasonal scales and examined the main ecological factors influencing those events. We found that in all populations association patterns increased non-linearly with HRO, similarly across seasons, but remain highly variable for specific HRO. Fission-fusion dynamics varied seasonally and similarly in all populations: fission and fusion frequency, as well as the duration of fusion periods, was greater in the wet season than in the dry season. Duration of fission periods were shorter in the wet season. At the daily scale, fission and fusion events were more likely to occur in the early morning and from mid-afternoon to early evening. Finally, whilst habitat structure did not influence both fusion and fission locations, we showed a strong effect of water availability on fission-fusion dynamics in one population. Our study shade light on the consistency of fission-fusion dynamics within species.

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