

Antilopine Wallaroo: the unusual 'roo has twins - a case study.

Sarah Hirst
PO Box 24 Darwin River NT 0841
Email: sarah44778@octa4.net.au

ABSTRACT: At the 2006 NWR Conference I presented my observations on breeding biology and growth and development of the antilopine wallaroo, along with some of the problems I encountered whilst working with these unique 'roos. I have continued to observe and record data and have now documented the first confirmed case of twins occurring in antilopine wallaroos.

In this paper I focus on the twins; including the first indication of twins, a comparison of growth rates when one twin was hand reared and one parent reared, and the possible causes of bias in this comparison.

Introduction

Antilopine wallaroos (*Macropus antilopinus*) are the largest macropods found across the tropical savanna of Northern Australia. (Fig 1.) They are gregarious animals, living in semi-permanent family groups, but during the Top End's Dry season males display a behaviour known as sexual segregation where they move away from the females and form bachelor groups (Ritchie, 2005-2006; Hirst, 2006). Antilopine wallaroos have no embryonic diapause or post partum oestrus and as a result have a distinct breeding season, with mating recorded between December and June (Hirst, 2006). The sexual segregation behaviour seen with males is thought to be due not only to the breeding hiatus but also to differential dietary requirements between males and females as this species shows significant sexual size dimorphism (Ritchie, 2005-2006). Adult male antilopine wallaroos reach more than twice the size of female antilopines (males 60-70kg, females 15-30kg. Hirst, 2006). Sexual dimorphism is also reflected in the coat color and becomes evident almost as soon as the pouch young develop fur. (Fig 2.)

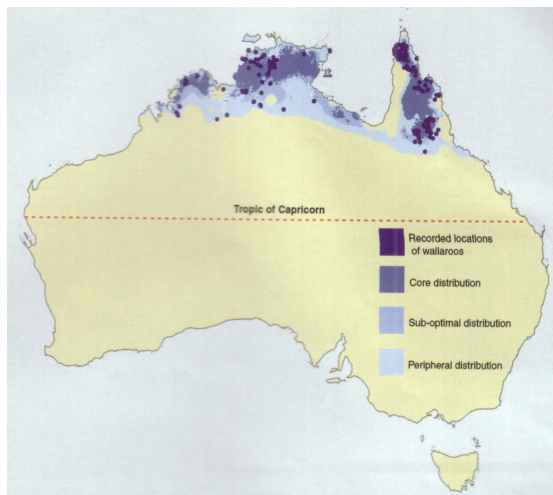


Fig 1. Distribution of the antilopine wallaroo.



Fig 2. Colour dimorphism in the antilopine wallaroo, female at left & male at right.

Multiple Birth in Macropods

In the musky rat kangaroo (*Hypsiprymnodon moschatus*) a small macropod found in the tropical rainforests of far north Queensland, twin births are common (with occasional triplets) but in most other macropod species twin births are rare. A few quick web searches reveal that twins have been recorded in eastern and western grey kangaroos, red kangaroos, swamp wallabies, agile wallabies, bennetts wallabies, Tasmanian pademelons, short-eared rock wallabies and long-nosed potoroos. Most cases of twins have been recorded from captive macropods where the animals are closely monitored. One captive agile wallaby in NSW that produced twins, went on to produce twin pouch young at each subsequent birth (pers. comm. D. Stanioch), suggesting that some individuals may twin repeatedly. It was also suggested that at the same institution only hand reared animals produced twins, but other anecdotal evidence refutes this.

I have found no previous records of twins occurring in antilopine wallaroos, and canvassing of zoological contacts revealed no reports of twins. The only possible case of antilopine twins was from a local carer who had two orphaned joeys brought in together as twins. Due to the lack of documentation and the inherent inaccuracy of passing orphaned joeys through a number of people this report can only be viewed as unsubstantiated. At the 2006 NWRC I told of one female antilopine in my study group that had mated repeatedly last year (which was great for determining oestrus cycle length) and finally produced pouch young in July. It wasn't until December that I realised that she actually had twin pouch young, and they were obviously not identical twins with one male and one female.

A Case Study of Antilopine Wallaroo Twins

The first clues

In the normal progression of the pouch life of an antilopine joey, no part of the joey appears outside of the pouch until after the joey opens its eyes at around 6 months (140 days) of age. The first unusual sign was the regular emergence of tiny red/pink joey limbs from about 15 weeks of age. While this seemed odd at the time it wasn't until later I understood the reason for it. I attempted to sex the joey by peeking into the pouch on several occasions over the next few weeks and although I came up with male on one occasion and female on the next, I still did not understand the significance. It then seemed strange that the female allowed her pouch to open whenever she was resting resulting in even more joey limbs exposed, but it was very hot at the time and this behaviour was very useful for monitoring fur development.

Twins!

Finally on the 10th of December I spotted three separate hocks and two tails protruding from the pouch whilst the female was resting. (Fig 3.) An inspection of the pouch revealed two joeys; one male and one female accounting for the alternate sexes I had attributed to the pouch young some weeks earlier. Both joeys appeared healthy and by this stage their eyes were open. I started to wonder how the mother would cope as the two joeys were already filling her pouch and they would normally need to stay in the pouch for at least another three months. On the 28th of December this problem was solved when I returned from work and found the male joey, standing behind a board on the verandah outside the back door, cold and grazed and yelling loudly for his mother. The female was still within earshot of the joey but appeared totally unconcerned, with the female twin still snug inside her pouch. In view of the expected time he should remain in the pouch, the fact that she had 'lost' him once (luckily on my door-step!) and that he would be unlikely to survive if dropped again somewhere else, I decided to hand raise him. I can only speculate on whether the mother abandoned her joey deliberately, or whether she dropped him by accident if she took fright whilst lying down with her pouch open, or perhaps he simply fell out of her lax pouch while she was resting and she did not notice.






Fig 3. Three hocks and two tails - Twins!

The perfect rearing comparison scenario

This situation presented the perfect opportunity to compare growth and development of a hand reared joey with that of a parent reared joey of identical age, from identical milk and conditions and presumably of identical size at the time of rearing changes. Unfortunately I was unable to remove the female twin from the pouch to weigh and measure her for a 'Day 0' comparison. I had previously observed some minor differences between the twins in the size of their feet and the shape (and size?) of their heads that I attributed to sex differences (Hirst, 2006). As I was unable to quantify these differences, I have assumed the twins were identical at Day 0 in this case study.

The growth curve for the twins supports and emphasises the data I presented at the 2006 NWRC (Hirst, 2006). Whilst the growth of the hand reared twin seemed quite good he did not begin to thrive until after he started eating solids, when his weight began increasing more rapidly. By comparison the parent reared twin's growth rate actually accelerated between first emergence and permanent exit and for a few months she was more than double the weight of her hand reared male sibling. Her growth began to plateau after permanent pouch emergence. (*Fig 4.*)



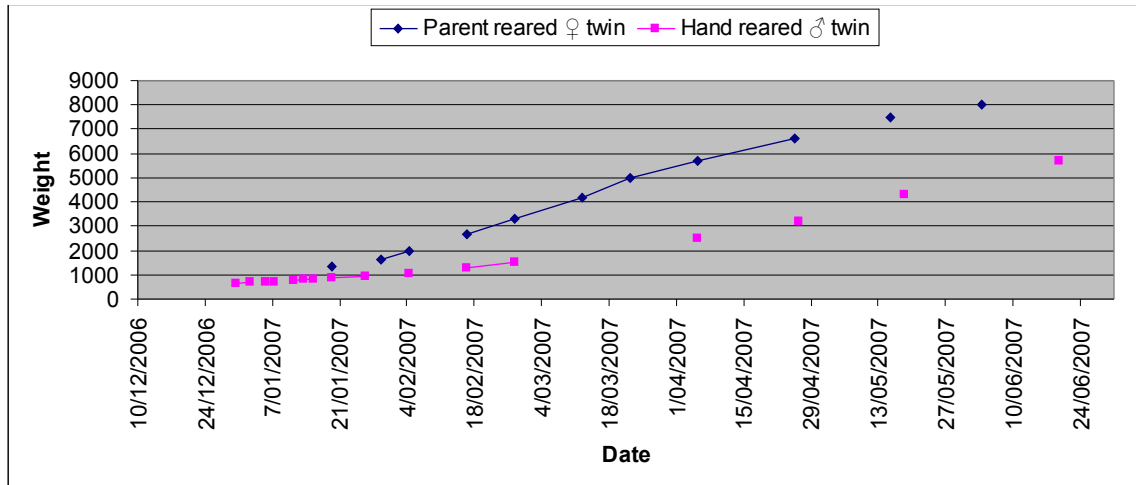


Fig 4. Growth comparison (by weight) between antilopine wallaroos twins where the female was parent reared and the male was hand reared.

Visible differences

Despite having the ideal role model for the rearing schedule I noticed an enormous difference in the appearance, development, overall size and physical ability of the twins. This discrepancy was most apparent in the rate of foot development. (Fig 5. & 6.)



Fig 5. The obvious size difference in the twins 12 weeks after Maxi (at right) was dumped.



Fig 6. The enormous difference in foot development between parent and hand rearing.

Comparative complications

After the male twin, “Maxi”, was dumped I monitored the teat use by the female twin. It occurred to me that if the remaining twin “Moppet”, had access to two teats potentially producing twice as much milk, and if she took advantage of this, then the comparison would be biased. Both teats remained active for several months, but the mammary glands did not appear to enlarge as much as was observed with a single joey at peak milk production, although this was impossible to quantitate. This suggests that while Moppet appeared to be drinking from both teats, she was probably taking a reduced amount from each. Her mother mated on the 12th of April 2007 and gave birth to a single joey on the 18th of May (+/- 1 day). The active teat nearest the neonate has since been abandoned and has started to regress. In an attempt to determine the effect of two active teats on growth rate of the parent reared twin, I compared the data of previous joeys from same mother to see if the now solo twin had grown significantly faster than normal. (Fig 7.) These growth curves definitely show more rapid growth in the female twin compared to both her single joey siblings, even with such limited data.

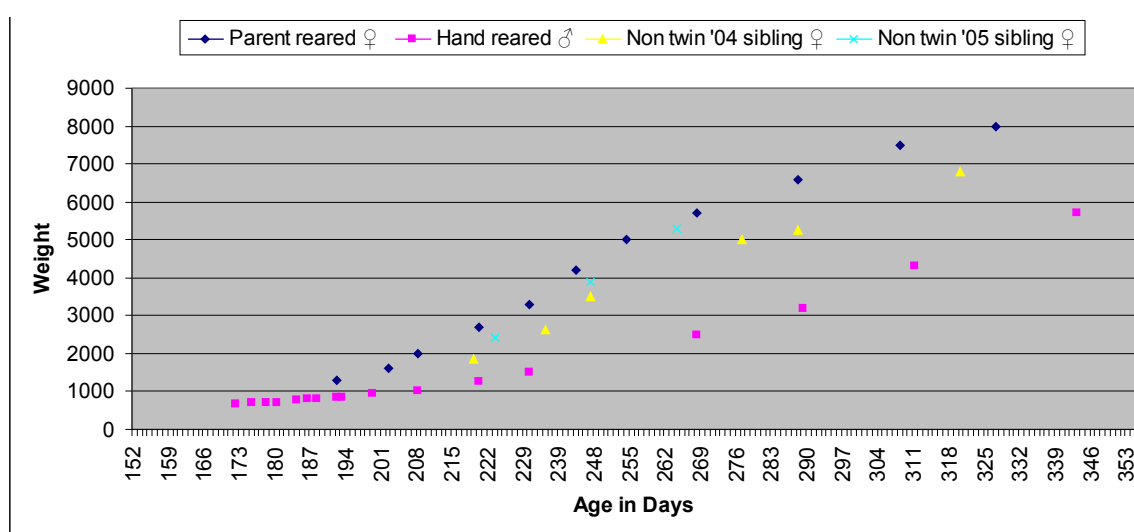


Fig 7. Comparison of the twin's growth rate (by weight) with non-twin siblings.

Whilst it would be nice to have the perfect comparison with no hand rearing artifacts, unfortunately in this instance that was not the case. Despite my best efforts Maxi, the hand reared twin, developed a *Candida* infection in his lower digestive tract after a month in care and required a 7 day course of Nilstat to remedy the problem. The infection did not appear to affect his growth rate and there is no setback visible on his growth curve, however it does cast some doubt on an unbiased comparison.

A second problem became evident in late February when soon after ceasing middle-of-the-right feeds I found Maxi was sucking the tip of his tail. On the 28th of February I placed Elastoplast tape on his tail to discourage the sucking. Unfortunately he then turned his attention to his syndactyl toes, and he continues to be a chronic toe sucker (Hirst, 2006).

The third and most serious problem occurred on the 8th of March when Maxi broke the tibia of his left leg just above the hock whilst hopping around on the grass. I do not know how he managed this but he had been struggling for a few days prior to the fracture with the sudden onset of bed wetting (he had never done so until then) and bloating or tightness in his abdomen that I was unable to relieve or explain. Based on this I suspect the tibia was probably cracked prior to actually displacing, and that the other symptoms were a pain response. I had been attempting to mimic the activity patterns of his parent reared sibling whilst raising Maxi but the increased amount of exercise may have been too much for his fragile legs.

I had an unfortunate experience with the first Vet clinic he was taken to, and as a result his leg was not set immediately. I finally managed to set his leg at home the following day with assistance from Mignon and Wildcare Inc. Obviously this was not ideal (nor recommended!) and the fracture was not correctly aligned, resulting in a deformed tibia as is shown on the x-rays in *Fig 8*. (I later sought the assistance of another Vet). While a minor deformity may not have resulted in compromised function, in this case the outward lateral curve in the tibia has resulted in the tendon pulling the growth plate off end of the calcaneum (heel). This has caused Maxi's foot to be quite rounded and when standing he rocks backward causing his toes to curl off the ground, and also prevents his hock joint extending fully. (*Fig 9*.)



Fig 8. X-ray of the misaligned fracture to Maxi's tibia.



Fig 9. Maxi's foot showing rounded hock and curled toes.

Despite his leg deformity Maxi can hop reasonably well, his upper leg development and muscle tone is quite normal and he does everything a normal antilopine joey would do including 'hooning' around and doing 'figure-of-eights' at full speed. It is highly unlikely that he will be suitable for release in the long term as his full speed is quite slow compared to a fully fit joey and the lack of full leg extension limits his vertical jumping ability. (*Fig 10*.) However, due to his importance in this comparison case study I have persisted with him, and I have identified a prospective long term home for him as a companion animal to aid with future rehabilitation.



Fig 10. Maxi will not be suitable for release due to his deformed leg, but he is doing well.

Summary

This case study provides documentary evidence that twins do occur in antilopine wallaroos. However, I suggest that if twins did occur in completely wild antilopines one of the joeys would be lost or abandoned prior to normal pouch emergence, as it would be very difficult for a female to carry two joeys for the full pouch life.

This presentation has focused on the growth comparison between parent reared and hand reared antilopine joeys using the twins. The growth curves are remarkably similar to those presented for parent reared and hand reared joeys at the 2006 NWR Conference, despite the problems encountered whilst rearing Maxi, with the hand reared joeys showing the same slow start. These graphs offer irrefutable evidence of the shortcomings of hand rearing joeys, and I believe the retardation of foot development in hand reared antilopine joeys may have been a contributing cause of Maxi's leg fracture, especially as I encouraged him to exercise in line with his age (sibling) not his physical development.

I aim to continue to observe and record data on this species for as long as this unique opportunity is available. I will also monitor future pouch young from the twin's mother in the hope that she may produce twins again and present another opportunity to compare sibling growth; but her latest pouch young, another female, is going solo.

Acknowledgements

I would like to thank Mignon (Wildcare Inc.) for her unfailing support, and Veronica and the team at University Avenue Veterinary Hospital for their efforts to give Maxi the best outcome. I would also like to thank the most important person (who I forgot to mention last year!) my husband Dave, who baby sits and feeds my joeys when I am at work, and my mother Rosemary, who has also assisted with Maxi. Finally I need to thank Wildcare for the support that has enabled me to attend the 2007 NWRC to share this case study.

BIOGRAPHY

Sarah Hirst is a dedicated wildlife carer who worked for 9 years at the Territory Wildlife Park (TWP) until recently. She developed a special interest in antilopine wallaroos through TWP, and has since gained a reputation locally as the 'antilopine lady' as she raises mostly antilopine joeys. She has had a hand in the raising and release of more than 40 antilopine wallaroos from her property at Blackmore River and, more recently releases from her family's property at Douglas River.

Sarah has had a unique opportunity to observe natural behaviour of antilopine wallaroos as some of the released antilopines at Blackmore River return to the property regularly. At the 2006 NRWC Sarah presented a paper outlining her observations on the biology of antilopines and data on growth and development of antilopine joeys. This year Sarah presents a case study of the first documented antilopine wallaroo twins. She has also brought along a video of her presentation from the 2006 conference, so if anyone is interested in watching it, please speak to Sarah afterward.

REFERENCES

- Arnold, G.W., Grassia, A., Steven, D.E., and Weeldenburg, J.R., 1991. Population ecology of western grey kangaroos in a remnant of wandoo woodland at Baker's Hill, southern Western Australia. *Wildlife Research* **18**(5): 561-575
- Calaby, J. H., 1998. in *The Mammals of Australia*. ed Strahan, R. Reed New Holland. Sydney. pp 324-325.
- Croft, D. B., 1982. Some observations on the behaviour of the Antilopine Wallaroo *Macropus antilopinus* (Marsupialia: Macropodidae). *Aust. Mammal.* **5**: 5-13
- Dennis, A.J. & Johnson, P.M., 1998. in *The Mammals of Australia*. ed Strahan, R. Reed New Holland. Sydney. pp 282-284
- Dawson, T. J., 1995. Kangaroos, biology of the largest marsupials. Cornell University Press. New York. pp 25-26, 45, 71, 77-78.
- Hirst, S., 2006. The Antilopine Wallaroo: an unusual 'roo. NWRC 2006 Proceedings.
- Inns, R.W. (1980). Occurrence of twins in macropod marsupials. *Search* **11**: 118-19.
- Ritchie, E., 2004. Unique kangaroo a tropical treasure. *Savanna Links* **29**: 8-9
- Ritchie, E., 2005-2006. Antilopine Wallaroo uncovered. *Nature Australia* Vol **28** No. 7 pp 24-31.
- 