



Peaceful primates, violent acts

Brought up in the Congo basin, Jonas Eriksson has worked through a war and battled poachers to help reveal the secrets of bonobo societies. **Carl Gierstorfer** reports.

In 1998 in Lomako, a study site in the northwestern Équateur province of the Democratic Republic of Congo, a peace-loving primate closely related to the chimpanzee showed its darker side. A group of bonobos (*Pan paniscus*) was feeding when a male started to act aggressively towards a female with an infant — an unwelcome act in the typically female-dominated primates. Suddenly, all hell broke loose. The females banded together to attack the male, and beat him viciously for more than a half hour. The other males fled, and the wounded aggressor disappeared, never to be seen again.

The event epitomizes a paradox in bonobo societies. DNA studies¹ done at the site have shown that the females aren't related, so cooperation would not benefit their kin directly. So why would females cooperate to exclude aggressive males? That is one thing that Gottfried Hohmann and Barbara Fruth from the Max Planck Institute (MPI) for Evolutionary Anthropology in Leipzig, Germany, had been studying at the Lomako site for eight years before the thrashing. But soon after the incident, violent raids from a different primate — human rebels from nearby Rwanda — evolved into a full-blown war that eventually reached Lomako and forced the researchers to leave.

A year before the event, Jonas Eriksson (pictured above), a former graduate student at the University of Uppsala in Sweden had joined the research team. The son of Swedish Baptist missionaries, Eriksson had spent his childhood in the pristine forests of the Salonga National Park in the central Congo basin and had gained a detailed knowledge of the region. While working on his degree, he learned about primate behaviour and field studies. The softly spoken 38-year-old says that he thought of his childhood hunting trips with bow and poison arrow and knew he could contribute something to the field. He was to prove instrumental in keeping the research going during the crisis.

In 2000, Hohmann and Eriksson set out on a trip worthy of Henry Morton Stanley's epic exploration of the Congo basin in the 1870s. They combed the better part of the bonobo's range — around 200,000 square kilometres — by foot and bicycle, hunting for bonobo faeces, scooping them from the forest floor, sealing them in plastic bags and sending them to Leipzig to sequence their DNA. Although a dirty job, this way of collecting DNA samples

puts as little stress on the bonobos as possible. Their analysis of 34 males from four distinct sites² showed that males from the same site had more similar Y chromosomes than did those from different sites, indicating that related males stay together, as they

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— Brenda Bradley

do in chimp societies. But mitochondrial DNA from these males, which is inherited down the female line, did not show such clustering, indicating that females tend to leave the group. Combined with their observation that females will work together to maintain their dominant status within their society, these findings further challenged the idea that genetic relatedness plays any part in female cooperation.

Brenda Bradley, an evolutionary geneticist at the University of Cambridge, UK, says that many researchers realized that they were "overestimating genetic relatedness when they see cooperation." Eriksson and colleagues' work helped to clarify that issue by providing data on long-range gene flow in the apes, she says.

Chimpanzees (*Pan troglodytes*) have a similar kinship pattern but behave differently. Like the bonobos, female chimps in a group are

generally unrelated. But unlike the bonobos, chimp societies tend to be dominated by the males. Whereas violent encounters are the norm in the chimp society, conflicts such as that observed at Lomako are rare in bonobos. Perturbations to bonobos' social order are generally defused through sexual acts, often in homoerotic encounters between females.

Secret for success

Eriksson and Hohmann had been hunting for more than just bonobo droppings on their trek. They had also been looking for a new study site and settled on the southern reaches of Salonga National Park. Eriksson's mastery of the Congolese language and culture were integral to securing permission from villagers to use the site. "He has a strong emotional attachment to Congo and the Congolese people," Hohmann says.

Fruth says that she admires Eriksson's ability to penetrate the Congolese culture. But his intimate link also has its downsides: Fruth says that Eriksson's 'Congolese' way of approaching things means that he refuses the pace of the western world and prefers a more laid-back lifestyle. "He has to be pushed to bring things to an end," he says. Nevertheless, the team managed to secure the study site in 2000, and work could resume. For Hohmann, Fruth and Eriksson, a new opportunity to explore the bonobo paradox began to take shape.

The researchers think that the cooperation between unrelated females to keep aggressive males in check was to protect against infanticide, which is common in male chimps — bonobos closest rela-



Bonobos cooperate more than genetics predicts.

tives. Moreover, the females may pool their efforts to collect high-value resources such as meat. Hohmann and Fruth have found that at Salonga, meat consumption is much more pronounced than previously thought in the normally fruit-eating apes. The prey is caught by females, possibly even in groups, and males rarely share in their spoils — a striking contrast to chimpanzees. "They are just sitting there, begging for meat, or even guarding the kids only to score well with the females," Fruth says.

The lack of male aggression could be down to the plentiful supply of good-quality resources. Meat might be a delicacy enjoyed only by the

females, but fruit is abundant and sex is readily available, reducing the need for competition.

But while Eriksson was in Leipzig sequencing the bonobo droppings, a new problem erupted. The bitter war that shook the country and cost an estimated four million human lives had ended, but leftover weapons were being put to use in the bush-meat trade.

"Suddenly, in 2005, I got these reports from my friends in Congo that the poachers were coming closer and closer to that area that's really fond to me," says Eriksson. For more than two years poachers had been moving steadily into the Salonga National Park, mainly targeting the abundant and easy to kill red colobus monkey. "They pick them off like fruit," Eriksson says. As colobus numbers dwindle, the bonobos are more likely to be targeted.

Trading places

So, with support from his mentors, Eriksson abandoned his research to protect the site. He convinced local park rangers and villagers to help him chase out the poachers, armed with automatic weapons. "I think the combination of being foreign, white-skinned, but speaking to them in a way that penetrates their culture and language is the key," Eriksson says. His approach has been effective in keeping the poachers out of the study site, at least for now.

Having put down his pipette for an AK-47, Eriksson says that he's determined to return to science, but not necessarily in the same role. "I probably won't spend too much more time in a lab; it's a waste of time. There are other people who are much more skilled than me." Hohmann chides that Eriksson's "academic ambitions are easily outrun by his liking for adventures". Nevertheless, Salonga is still in danger and the conflict is bound to escalate as the poachers take greater risks. Eriksson says that he has already received death threats.

Having seen their Lomako site collapse, the team is determined to hold on to the one in Salonga. Too many questions remain about how bonobos manage to avoid violent conflicts. Ironically, saving the peaceful bonobos from the poachers may require more aggressive displays. Eriksson says: "I did not spend years studying to run around in the forest with a Kalashnikov and my finger on the trigger. But emotionally, it is very easy to convince myself that these steps are necessary. I have to try to do something." ■

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To see a video of Jonas Eriksson discussing his work, see <http://tinyurl.com/ywnv47>.

1. Gerloff, U., Hartung, B., Fruth, B., Hohmann, G. & Tautz, D. *Proc. R. Soc. Lond. B* **266**, 1189–1195 (1999).
2. Eriksson, J. et al. *Mol. Ecol.* **15**, 939–949 (2006).



The bush-meat trade is starting to threaten the bonobo study site.