Supporting Information

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SI Materials and Methods

Study Site and Sample Collection. This study was conducted in an ongoing long-term project on the behavioral ecology of bonobos at the field study of LuiKotale in the Democratic Republic of Congo. The site (lat 02°45.610′S, long 20°22.723′E) is part of a large continuous forest block close to the western border of Salonga National Park. It consists of tropical lowland forest with a closed canopy and small patches of grassland. Rainfall exceeds 2000 mm/year, and seasonal variation in temperature and precipitation is moderate. The information presented relates to the members of one bonobo group (Bompusa community). All subjects were identified and habituated to human presence by the time the study started in spring 2008. Age estimates were based on physical features such as body size, dentition, and (in females) genital swellings.

Hair samples from bonobos were collected systematically from fresh night nests after bonobos had left the nest site. Information on the identity of the nest owner came from direct observations. Identified nests were tagged on the ground to facilitate detection by the human tree climber. Multiple individuals could be sampled repeatedly during the period of data collection (March–August 2009) and provide a data set covering a period of 9 mo (December 2008–August 2009) In addition to the collection of faunal samples, efforts were made to obtain sample material from carcasses of those species actually consumed by bonobos. All tissue samples were stored in containers with dry gel. Plant samples were first stored in liquid nitrogen and later lyophilized.

Observations of feeding behavior were recorded during focal scans and ad libitum. The LuiKotale bonobos consume plant food from a range of plant species. For the months presented here, the spectrum ranged from 7 to 20 major plant species, with a mean of 13 plant species per month, some of which were consumed only once or twice a month. To assess the most dominant food plants of bonobo diet for each month, we ranked species according to

frequency of consumption, selecting the top five plant species for each month (Table S4). The data presented in Table S4 is a good proxy for monthly diet because observational data covered information neither on the exact time spent feeding nor on the amount of plant fiber or protein ingested.

All hair and environmental samples were purified before isotopic analysis. Hair samples were cleaned in a mixture of methanol and chloroform (2:1 vol/vol) for 24 h in a rotator to remove attached lipids or dirt (1). The samples were then rinsed twice with de-ionized water, dried down in an oven overnight at 40 °C, and transferred to a microscopic room. The hair samples were sorted for hairs with intact follicles under a stereo microscope with 50× magnification. Hair samples of females had to be checked for short or thin hair that could have come from infants sleeping in the nests of their mothers. For females, therefore, only long hairs with consistent thickness and length (more than 3 cm) were sampled; shorter and thinner hairs were separated and excluded for this study as potential infant hair. The selected hair was aligned at the root under the microscope and, depending on the amount of hair (length and weight), cut into 0.5-cm (= 2 wk) to 2-cm (= 2 mo) sections with a scalpel. Each section of hair (≥ 0.4 mg) was transferred into tin capsules for isotopic measurement.

Hair, feathers, and insects were treated with the same cleaning procedure as the bonobo hair, and then bulk samples were weighed into tin capsules for combustion. Plant items were freezedried, homogenized, and then weighed into capsules. Tissues such as snake skin and fish scales were degreased in a rotator for several days and then weighed into capsules for measurement.

Statistics. Spearman correlations were used to investigate the relationship between the two isotope measures $(\delta^{13}C, \delta^{15}N)$ and male rank. The impact of age on isotope measures was tested with an exact Mann–Whitney U test provided by the package exactRankTests (2) for R (3).

O'Connell TC, Hedges REM, Healey MA, Simpson AHRW (2001) Isotopic comparison of hair, nail and bone: Modern analyses. J Archaeol Sci 28:1247–1255.

Hothorn T, Hornik K (2010) ExactRankTests: Exact distributions for rank and permutation tests. R package, Version 0.8–19.

R Development Core Team (2009) R: A Language and Environment for Statistical Computing (R Foundation for Statistical Computing, Vienna).

Table S1. Stable isotope ratios of plant samples from Salonga

| | | • | | | | | | | | |
|-------------------|-----------------------------|------------------|-------|--------|---------|------------------|------------------|------|-----|-------|
| Vernacular name | Species | Family | Type | Sample | Food? | δ^{13} C% | δ^{15} N% | %C | %N | C:N |
| Inkuma rouge | Marantochloa purpurea | Marantaceae | Herb | Leaves | Food | -34.2 | 6.8 | 42.6 | 2.4 | 20.6 |
| Bokombe | Haumania leonardiana | Marantaceae | Herb | Pith | Food | -33.7 | 4.9 | 49.5 | 3.4 | 16.8 |
| Nkokoloko | Sarcophrynium schweinfurth. | Marantaceae | Herb | Leaves | Food | -36.2 | 3.7 | 50.7 | 1.9 | 30.6 |
| Botaatata | Cissus dinklagei | Vitaceae | Liana | Fruit | Food | -27.3 | 2.6 | 39.9 | 0.7 | 62.7 |
| Botshuatope | Landolphia owariensis | Apocynaceae | Liana | Fruit | Food | -27.1 | 5.0 | 45.0 | 0.9 | 58.2 |
| Lokumo I | Ficus sp. | Moraceae | Liana | Fruit | Food | -30.4 | 7.2 | 48.8 | 1.1 | 51.5 |
| Lokumo II | Ficus sp. | Moraceae | Liana | Fruit | Food | -32.5 | 5.8 | 50.1 | 1.1 | 51.2 |
| Lokosa | Manniophyton fulvum | Euphorbiaceae | Liana | Leaves | Food | -29.8 | 7.8 | 50.6 | 2.1 | 28.3 |
| Boele | Canarium schweinfurthii | Burseraceae | Tree | Fruit | Food | -29.3 | 6.1 | 62.2 | 0.9 | 77.6 |
| Booso | Blighia welwitschii | Sapindaceae | Tree | Fruit | Food | -28.6 | 5.3 | 71.6 | 2.5 | 33.6 |
| Bopidzi | Scorodophloeus zenkeri | Caesalpiniaceae | Tree | Fruit | Food | -26.6 | 7.0 | 46.3 | 3.6 | 14.9 |
| NID | Nauclea sp. | Rubiaceae | Tree | Fruit | Food | -28.1 | 7.0 | 45.9 | 0.4 | 124.4 |
| Ilonge Pambu | Manilkara yangambiensis | Sapotaceae | Tree | Fruit | Food | -27.1 | 4.6 | 45.2 | 0.9 | 57.3 |
| Bodzilo Mpongo | Parinari excelsa | Chrysobalanaceae | Tree | Fruit | Food | -28.5 | 5.7 | 46.9 | 8.0 | 65.2 |
| Bopambu | Gambeya lacourtiana | Sapotaceae | Tree | Fruit | Food | -25.7 | 5.1 | 58.4 | 1.5 | 44.4 |
| Ipambwa | Sorindea sp. | Anacardiaceae | Tree | Fruit | Food | -28.9 | 6.9 | 47.7 | 1.3 | 44.3 |
| Londaa | NID | Vitaceae | Tree | Fruit | Food | -27.8 | 6.5 | 52.9 | 1.0 | 62.3 |
| Boseki ya moindo | Klainedoxa gabonensis | Irvingiaceae | Tree | Fruit | Food | -33.4 | 5.4 | 43.9 | 1.1 | 47.4 |
| Bokodzi | Mammea africana | Clusiaceae | Tree | Fruit | Food | -27.7 | 4.6 | 47.5 | 0.6 | 87.4 |
| Bopambu | Gambeya lacourtiana | Sapotaceae | Tree | Fruit | Food | -28.4 | 6.6 | 55.9 | 1.1 | 61.4 |
| Botende | Pancovia laurentii | Sapindaceae | Tree | Fruit | Food | -27.1 | 5.7 | 43.7 | 1.1 | 44.5 |
| Bopfumo | Grewia coriacea | Tiliaceae | Tree | Fruit | Food | -28.2 | 4.9 | 42.4 | 1.0 | 47.9 |
| Boseki ya pembe | Irvingia gabonensis | Irvingiaceae | Tree | Fruit | Food | -26.9 | 6.0 | 43.9 | 0.9 | 55.0 |
| Bosepe | Garcinia punctata | Clusiaceae | Tree | Fruit | Food | -31.6 | 6.1 | 54.8 | 1.0 | 64.4 |
| Bopfunga | Synsepalum sp. | Sapotaceae | Tree | Fruit | Food | -26.2 | 3.5 | 41.8 | 1.6 | 30.8 |
| Isila Alongi | Colletoecema dewevrei | Rubiaceae | Tree | Fruit | Food | -28.2 | 5.7 | 45.9 | 1.7 | 32.5 |
| Maku pembe | Dialium sp. | Caesalpiniaceae | Tree | Fruit | Food | -24.7 | 5.1 | 40.4 | 0.7 | 63.7 |
| Boleko | Onkogea gore | Olacaceae | Tree | Fruit | Nonfood | -28.3 | 5.6 | 45.4 | 2.1 | 25.6 |
| Botolo | Picralima nitida | Apocynaceae | Tree | Fruit | Nonfood | -32.2 | 9.3 | 44.3 | 1.4 | 35.7 |
| Kalanga ya moindo | Drypetes cinnabarina | Euphorbiaceae | Tree | Fruit | Nonfood | -26.9 | 5.3 | 48.8 | 1.1 | 49.5 |
| Bontole | Dicranolepis soyauxii | Thymeleaceae | Tree | Bark | Nonfood | -29.4 | 5.1 | 52.8 | 0.5 | 113.8 |
| Kukola | NID | NID | Tree | Bark | Nonfood | -26.9 | 4.3 | 47.2 | 1.2 | 47.6 |
| Bontole | Dicranolepis soyauxii | Thymeleaceae | Tree | Bark | Nonfood | -29.6 | 4.7 | 54.6 | 0.6 | 108.1 |

Samples classified as "nonfood" are only partly ingested by bonobos. The isotope ratios are reported relative to the international standards VPDB (Vienna Pee Dee Belemnite) for δ^{13} C and AIR (atmospheric air) for δ^{15} N. NID, could not be identified.

Table S2. Measurement results for animal tissue samples from Salonga

| Common name | Scientific classification | Diet | Tissue | δ^{13} C% | $\delta^{15}N\%$ | %C | %N | C:N |
|-----------------------|---------------------------|--------|---------|------------------|------------------|------|------|-----|
| Primates | | | | | | | | |
| Red colobus | Procolobus thollori | f/fo | Hair | -25.1 | 9.1 | 45.7 | 13.9 | 3.9 |
| Red colobus | Procolobus thollori | f/fo | Hair | -25.1 | 9.0 | 45.1 | 14.9 | 3.5 |
| Guenon* | Cercopithecus sp. | f/i | Hair | -23.4 | 11.0 | 43.4 | 14.5 | 3.5 |
| Guenon* | Cercopithecus sp. | f/i | Hair | -23.6 | 11.2 | 44.0 | 13.8 | 3.7 |
| Mangabey | Cercocebus aterrimus | f/i | Hair | -26.3 | 9.5 | 44.8 | 15.3 | 3.4 |
| | | | Mean | -24.7 | 10.0 | | | |
| | | | SD | 1.2 | 1.1 | | | |
| Ungulates | | | | | | | | |
| Black-fronted duiker | Cephalophus nigrifrons | f/fo | Hair | -26.8 | 7.6 | 41.6 | 14.6 | 3.3 |
| Blue duiker | Cephalophus monticola | f/fo | Hair | -25.6 | 8.3 | 43.8 | 14.7 | 3.5 |
| Yellow-backed duiker | Cephalophus silvicultor | f/fo | Hair | -26.9 | 8.2 | 44.2 | 15.3 | 3.4 |
| Blue duiker | Cephalophus monticola | f/fo | Hair | -25.4 | 9.5 | 43.5 | 14.9 | 3.4 |
| Red river hog | Potamochoerus porcus | 0 | Hair | -24.7 | 9.9 | 44.3 | 14.5 | 3.6 |
| | | | Mean | -25.9 | 8.7 | 43.3 | | |
| | | | SD | 0.9 | 1.0 | | | |
| Birds | | | | | | | | |
| Congo peacock | Afropavo congensis | f/i | Feather | -24.8 | 12.4 | 43.0 | 13.3 | 3.8 |
| Congo peacock | Afropavo congensis | f/i | Quill | -24.6 | 12.8 | 45.9 | 14.9 | 3.6 |
| Great blue turako | Corythaeola cristata | f/i | Feather | -24.3 | 10.0 | 40.4 | 11.8 | 4.0 |
| Hornbill | Ceratogymna sp. | 0 | Feather | -24.7 | 10.3 | 47.0 | 14.2 | 3.9 |
| Guineafowl | Guttera sp. | f/i | Feather | -25.0 | 9.8 | 48.0 | 15.5 | 3.6 |
| Bird I | Aves (class) | c | Feather | -20.2 | 17.6 | 46.5 | 13.7 | 3.9 |
| Bird II | Aves (class) | ? | Feather | -24.9 | 10.0 | 48.8 | 12.7 | 4.5 |
| Bird III | Aves (class) | ? | Feather | -22.9 | 13.0 | 46.0 | 14.3 | 3.7 |
| Bird IV | Aves (class) | ? | Feather | -24.5 | 13.6 | 43.5 | 13.8 | 3.7 |
| | , | | Mean | -23.9 | 12.0 | | | |
| | | | SD | 1.6 | 2.6 | | | |
| Rodents | | | | | | | | |
| Brushtailed porcupine | Atherurus africanus | f/fo | Whisker | -24.0 | 9.7 | 43.5 | 15.3 | 3.3 |
| Brushtailed porcupine | Atherurus africanus | f/fo | Spike | -24.5 | 9.4 | 43.0 | 14.7 | 3.4 |
| Forest giant squirrel | Protoxerus stangeri | f | Hair | -23.9 | 7.4 | 45.9 | 15.1 | 3.5 |
| Rodent I | Rodentia (order) | ? | Hair | -24.7 | 11.1 | 46.0 | 14.3 | 3.8 |
| Rodent II | Rodentia (order) | ? | Hair | -24.6 | 10.1 | 45.0 | 14.0 | 3.7 |
| Rodent III | Rodentia (order) | c? | Hair | -24.8 | 14.7 | 45.9 | 14.2 | 3.8 |
| | , | | Mean | -24.4 | 10.4 | | | |
| | | | SD | 0.4 | 2.4 | | | |
| Insects | | | | | | | | |
| Army ants | Dorylus sp. | c/i | Whole | -25.7 | 12.5 | 46.0 | 12.4 | 4.3 |
| Termites | Macrotermes sp. | X | Whole | -25.8 | 3.8 | 40.4 | 18.9 | 2.6 |
| Caterpillar | Lepidoptera (order) | fo | Whole | -23.8 | 8.3 | 44.4 | 11.7 | 4.4 |
| Butterfly | Lepidoptera (order) | ? | Wing | -33.6 | 10.8 | 46.7 | 9.6 | 5.8 |
| Batterny | zepraoptera (oraer) | - | Mean | -27.2 | 8.8 | 10.7 | 5.0 | 5.0 |
| | | | SD | 4.3 | 3.8 | | | |
| Other | | | | 1.5 | 3.5 | | | |
| Snake | Reptilia (order) | С | skin | -26.0 | 16.5 | 46.7 | 14.3 | 3.8 |
| Fish | Pisces (class) | ? | scales | -24.9 | 14.7 | 18.0 | 6.1 | 3.4 |
| Civet cat | Viverridae (family) | : O | Hair | -24.9 -23.0 | 11.3 | 44.9 | 15.2 | 3.5 |
| Civer car | viverridae (tattilly) | U | Mean | -23.0 -24.6 | 14.1 | 77.3 | 13.4 | ر.د |
| | | | SD | -24.6 1.5 | 2.7 | | | |

The isotope ratios are reported relative to the international standard VPDB (δ^{13} C) and AIR (δ^{15} N). The SD is reported with 1 σ . f : frugivore; fo: folivore; o: omnivore; i: insectivore; c: carnivore; x: xylophag; ?: unknown.

^{*}Samples obtained from bonobo hunts.

Table S3. Measurement of isotopes in the hair samples from Salonga bonobos

| Sample no. | Name | Sex | Sample section | Date of sampling | δ^{13} C% | δ^{15} N% | %C | %N | C:N |
|------------------|--------------|------------------|--------------------|------------------|------------------|------------------|--------------|--------------|------------|
| 13504A | Eva | Female | 0–2.2 cm | 21/04/2009 | -25.5 | 8.3 | 44.5 | 14.9 | 3.5 |
| 13504B | Eva | Female | 2.2–5 cm | | -26.7 | 7.9 | 40.7 | 12.3 | 3.9 |
| 13405A | Eva | Female | 0–1 cm | 01/09/2009 | -25.6 | 8.3 | 59.1 | 19.6 | 3.5 |
| 13405B | Eva | Female | 1–3 cm | | -25.6 | 8.5 | 44.1 | 14.2 | 3.6 |
| 14098A | Eva | Female | 0–1.5 cm | 19/07/2009 | -25.3 | 8.8 | 43.2 | 14.4 | 3.5 |
| 14098B | Eva | Female | 1.5–4 cm | 20/04/2000 | -25.5 | 8.9 | 43.0 | 13.9 | 3.6 |
| 13506A | Gwen | Female | 0–1 cm | 29/04/2009 | -25.5 | 8.2 | 43.7 | 14.6 | 3.5 |
| 13506B | Gwen | Female | 1–3 cm | 02/06/2000 | -25.8 | 8.4 | 43.5 | 13.5 | 3.8 |
| 13507A | Gwen | Female | 0–2 cm | 03/06/2009 | -25.5 26.0 | 8.4 | 44.5 | 14.9 | 3.5 |
| 13507B 14100A | Gwen | Female Female | 2–5 cm 0–1.5 cm | 00/00/2000 | −26.0 −25.6 | 8.0 8.6 | 43.7 42.5 | 13.4 | 3.8 3.5 |
| 14100A 14100B | Gwen Gwen | Female | 1.5–4 cm | 08/08/2009 | –25.6 –26.1 | 8.5 | 42.5 42.4 | 14.1 12.7 | 3.9 |
| 13508A | Hanna | Female | 0–2 cm | 14/04/2009 | -26.1 -25.3 | 8.6 | 32.8 | 11.1 | 3.4 |
| 13508A 13508B | Hanna | Female | 2–5 cm | 14/04/2009 | -25.5 -26.0 | 8.7 | 43.8 | 13.6 | 3.8 |
| 13509A | Hanna | Female | 0–2 cm | 31/05/2009 | -25.6 | 8.3 | 44.1 | 14.5 | 3.5 |
| 13509B | Hanna | Female | 2–5 cm | 31103/2003 | -26.4 | 8.9 | 54.1 | 13.6 | 4.7 |
| 14097A | Hanna | Female | All hair | 15/07/2009 | -25.4 | 8.5 | 42.5 | 14.0 | 3.5 |
| 13510A | Hanna | Female | 0–2 cm | 05/06/2009 | -25.5 | 8.4 | 44.4 | 14.8 | 3.5 |
| 13510B | Hanna | Female | 2–4 cm | | -26.3 | 8.4 | 44.1 | 12.4 | 4.1 |
| 12577A | Iris | Female | 0–2 cm | 13/03/2009 | -25.9 | 8.6 | 44.9 | 15.2 | 3.4 |
| 12577B | Iris | Female | 2–4 cm | | -25.7 | 8.5 | 44.5 | 14.3 | 3.6 |
| 13511A | Iris | Female | 3 hairs | 24/04/2009 | -25.9 | 8.8 | 43.9 | 13.1 | 3.9 |
| 13512A | Iris | Female | 3 hairs | 05/06/2009 | -25.6 | 8.5 | 44.2 | 14.4 | 3.6 |
| 13512B | Iris | Female | All hair | | -25.7 | 8.4 | 44.2 | 14.8 | 3.5 |
| 13513A | Martha | Female | 0–1,5 cm | 26/05/2009 | -25.7 | 8.5 | 35.5 | 11.8 | 3.5 |
| 13513B | Martha | Female | 1.5–3.5 cm | | -26.0 | 8.8 | 44.4 | 14.0 | 3.7 |
| 13514A | Martha | Female | 1 long hair | 23/06/2009 | -26.2 | 8.3 | 44.5 | 14.6 | 3.5 |
| 13515A | Olga | Female | 1 long hair | 06/04/2009 | -26.0 | 8.5 | 44.1 | 14.6 | 3.5 |
| 13516A | Olga | Female | 0–2 cm | 30/05/2009 | -25.7 | 8.8 | 43.4 | 14.8 | 3.4 |
| 13516B | Olga | Female | 2–4.5 cm | | -25.6 | 8.8 | 43.7 | 14.2 | 3.6 |
| 13517/18A | Olga | Female | 0–1 cm | 17/06/2009 | -25.7 | 8.6 | 43.6 | 14.7 | 3.5 |
| 13517/18B | Olga | Female | 1–2 cm | | -25.8 | 8.7 | 44.1 | 14.4 | 3.6 |
| 13517/18C | Olga | Female | 2–4.5 cm | 40/05/2000 | -25.5 | 8.6 | 44.1 | 14.4 | 3.6 |
| 13518A | Olga | Female | 0–1 cm | 19/06/2009 | -25.2 | 8.7 | 44.1 | 14.9 | 3.5 |
| 13518B | Olga | Female | 1–2 cm | | -25.6 25.0 | 8.5 | 43.3 | 14.6 | 3.5 |
| 13518C | Olga | Female | 2–3 cm | | –25.9 –25.8 | 8.7 8.2 | 44.3 43.3 | 14.7 | 3.5 3.4 |
| 13518D 14099A | Olga Olga | Female Female | 3–4 cm 0–1.5 cm | 28/07/2009 | -25.6 -25.7 | 8.9 | 43.3 42.6 | 14.8 14.3 | 3.5 |
| 14099A 14099B | Olga | Female | 1.5–3 cm | 20/07/2009 | -25.7 -26.1 | 8.7 | 42.0 | 14.0 | 3.5 |
| 14099C | Olga | Female | 3–4.5 cm | | -26.1 -26.1 | 8.4 | 42.2 | 13.6 | 3.7 |
| 14099D | Olga | Female | 4.5–7 cm | | -26.4 | 8.4 | 40.8 | 12.3 | 3.9 |
| 12580A | Paula | Female | 0–2 cm | 11/03/2009 | -26.0 | 8.9 | 44.2 | 14.7 | 3.5 |
| 12580B | Paula | Female | 2–4 cm | 11/03/2003 | -25.9 | 8.8 | 43.2 | 14.5 | 3.5 |
| 13520A | Paula | Female | 0–2 cm | 16/05/2009 | -25.8 | 8.6 | 44.6 | 14.8 | 3.5 |
| 13520B | Paula | Female | 2–4.5 cm | | -26.0 | 8.9 | 49.4 | 15.8 | 3.7 |
| 13521A | Paula | Female | 0–2 cm | 04/06/2009 | -25.8 | 8.3 | 44.8 | 14.9 | 3.5 |
| 13521B | Paula | Female | 2–4 cm | | -26.0 | 8.6 | 46.3 | 15.4 | 3.5 |
| 13521C | Paula | Female | 4–7 cm | | -26.3 | 8.7 | 46.3 | 15.4 | 3.5 |
| 13519A | Paula (?) | Female | 3×3 –4 cm | 31/03/2009 | -25.7 | 8.2 | 44.4 | 14.6 | 3.6 |
| 12579A | Rio | Female | 0–2 cm | | -25.7 | 8.6 | 44.8 | 14.9 | 3.5 |
| 12579B | Rio | Female | 2–4 cm | | -25.9 | 8.8 | 44.6 | 14.9 | 3.5 |
| 13522A | Rio | Female | 0–2 cm | 07/06/2009 | -25.3 | 8.4 | 46.8 | 15.7 | 3.5 |
| 13522B | Rio | Female | 2–~5 cm | | -25.2 | 8.5 | 46.5 | 15.5 | 3.5 |
| 12578A | Uma | Female | 0–2 cm | 18/03/2009 | -25.9 | 8.6 | 45.3 | 15.0 | 3.5 |
| 12578B | Uma | Female | 2–4 cm | | -26.4 | 8.4 | 44.6 | 13.4 | 3.9 |
| 13523A | Uma | Female | 2 hairs | 26/04/2009 | -25.2 | 8.3 | 48.2 | 15.4 | 3.6 |
| 13523B | Uma | Female | 3 hairs | | -25.5 | 8.2 | 46.6 | 15.4 | 3.5 |
| 13525A | Venus | Female | 0–2 cm | 21/06/2009 | -25.4 | 8.3 | 47.7 | 15.5 | 3.6 |
| 13525B | Venus | Female | 2–5 cm | | -25.6 | 8.2 | 47.5 | 15.2 | 3.7 |
| 13526A | Zoe | Female - | All hair | 10/06/2009 | -25.8 | 8.3 | 47.2 | 14.4 | 3.8 |
| 13527A | Zoe | Female | 0–2 cm | 16/06/2009 | -25.5 | 8.1 | 47.8 | 15.6 | 3.6 |
| 13527B | Zoe | Female | 2–4.5 cm | | -25.7 | 8.4 | 47.7 | 14.6 | 3.8 |
| 14096B | Zoe | Female | 0–2.5 cm | 04/07/2009 | -25.9 | 8.2 | 42.8 | 14.4 | 3.5 |

Table S3. Cont.

| Sample no. | Name | Sex | Sample section | Date of sampling | δ^{13} C% | $\delta^{15}N\%$ | %C | %N | C:N |
|------------------------|--------------|--------------|------------------|------------------|------------------|------------------|--------------|--------------|------------|
| 14096C | Zoe | Female | 2.5–6 cm | | -25.8 | 8.3 | 42.2 | 13.9 | 3.5 |
| 12573A | Apollo | Male | 0–1 cm | 06/03/2009 | -25.7 | 7.8 | 43.5 | 14.8 | 3.4 |
| 12573B | Apollo | Male | 1–2 cm | | -25.8 | 8.0 | 45.0 | 15.0 | 3.5 |
| 12573C | Apollo | Male | 3–4 cm | | -25.8 | 8.0 | 44.5 | 15.0 | 3.5 |
| 12574 | Apollo | Male | All hair | 15/03/2009 | -25.8 | 8.3 | 44.4 | 15.0 | 3.5 |
| 13529A | Apollo | Male | 0–1 cm | 29/05/2009 | -25.6 | 8.1 | 47.3 | 15.3 | 3.6 |
| 13529B | Apollo | Male | 1–2 cm | | -26.3 | 8.3 | 47.4 | 14.0 | 4.0 |
| 13530A | Ben | Male | 0–2 cm | 01/05/2009 | -25.6 | 8.5 | 47.7 | 15.5 | 3.6 |
| 13530B | Ben | Male | 2–5 cm | | -25.9 | 8.5 | 47.4 | 15.3 | 3.6 |
| 13531A | Ben | Male | 0–2 cm | 10/06/2009 | -25.7 | 8.3 | 48.3 | 15.8 | 3.6 |
| 13531B | Ben | Male | 2–4 cm | | -25.4 | 8.4 | 47.7 | 15.5 | 3.6 |
| 13532A | Camillo | Male | 0–1 cm | 05/04/2009 | -25.9 | 8.8 | 47.4 | 15.5 | 3.6 |
| 13532B | Camillo | Male | 1–2 cm | | -25.9 | 8.8 | 47.6 | 15.5 | 3.6 |
| 13532C | Camillo | Male | 2–3 cm | | -26.2 | 9.0 | 47.0 | 15.0 | 3.7 |
| 13532D | Camillo | Male | 3–5 cm | | -26.2 | 9.0 | 46.5 | 14.6 | 3.7 |
| 14101A | Camillo | Male | 0–1.5 cm | 15/07/2009 | -25.5 | 8.4 | 42.3 | 14.3 | 3.5 |
| 14101B | Camillo | Male | 1.5–3 cm | | -25.7 | 8.4 | 42.6 | 14.1 | 3.5 |
| 14101C | Camillo | Male | 3–6 cm | | -25.7 | 8.3 | 41.8 | 13.9 | 3.5 |
| 13533A | Dante | Male | 0–1 cm | 12/04/2009 | -25.8 | 8.4 | 44.9 | 15.0 | 3.5 |
| 13533B | Dante | Male | 1–2 cm | | -26.0 | 8.6 | 45.4 | 14.8 | 3.6 |
| 13533C | Dante | Male | 2–5 cm | | -26.0 | 9.1 | 46.0 | 14.9 | 3.6 |
| 13534A | Dante | Male | 0–2.5 cm | 27/05/2009 | -25.6 | 8.9 | 46.0 | 15.0 | 3.6 |
| 13534B | Dante | Male | 2.5–6 cm | | -25.3 | 8.9 | 46.7 | 15.1 | 3.6 |
| 13535A | Emil | Male | 0–0.5 cm | 05/04/2009 | -25.6 | 8.2 | 45.9 | 15.1 | 3.6 |
| 13535B | Emil | Male | 0.5–1 cm | | -25.7 | 8.1 | 47.2 | 15.6 | 3.5 |
| 13535C | Emil | Male | 1–1.5 cm | | -25.8 | 8.2 | 46.9 | 15.1 | 3.6 |
| 13535D | Emil | Male | 1.5–2 cm | | -26.2 | 8.4 | 47.1 | 14.8 | 3.7 |
| 13535E | Emil | Male | 2–2.5 cm | | -26.2 | 8.5 | 46.3 | 14.7 | 3.7 |
| 13536A | Emil?? | Male | 0–2.5 cm | 22/04/2009 | -25.5 | 8.4 | 46.1 | 14.9 | 3.6 |
| 13536B | Emil?? | Male | 2.5–5 cm | | -25.8 | 8.6 | 46.1 | 14.6 | 3.7 |
| 12575 | Jack | Male | Single hair | 13/03/2009 | -26.0 | 8.0 | 45.2 | 15.3 | 3.4 |
| 13537A | Jack | Male | 0–2 cm | 06/06/2009 | -25.3 | 8.3 | 46.3 | 14.8 | 3.6 |
| 13537B | Jack | Male | 2–6 cm | 40/04/000 | -25.8 | 8.3 | 45.3 | 14.4 | 3.7 |
| 13538A | Max | Male | 0–0.7 cm | 13/04/2009 | -25.5 | 7.7 | 45.3 | 14.9 | 3.6 |
| 13538B | Max | Male | 0.7–1.5 cm | | -25.6 25.0 | 7.8 | 45.4 | 14.7 | 3.6 |
| 13538C | Max | Male | 1.5–2.5 cm | | -25.8 | 7.8 | 45.3 | 14.6 | 3.6 |
| 13538D | Max | Male | 2.5–3.5 cm | | -26.0 | 8.0 | 51.9 | 17.3 | 3.5 |
| 13538E | Max | Male | 3.5–5 cm | 00/05/2000 | -26.3 | 8.1 | 42.2 | 13.5 | 3.7 |
| 13539A | Pan | Male | 0–2.5 cm | 08/06/2009 | -25.3 | 8.2 | 42.2 | 14.4 | 3.4 |
| 13539B | Pan | Male | 2.5–5 cm | 11/04/2000 | -25.4 25.5 | 8.1 | 42.1 | 14.3 | 3.4 |
| 13540A | Tito | Male | 0–2.5 cm | 11/04/2009 | -25.5 | 8.5 | 43.0 | 14.7 | 3.4 |
| 13540B | Tito | Male | 2.5–5 cm | 14/05/2000 | -25.6 25.4 | 8.4 | 43.4 | 14.8 | 3.4 |
| 13541A | Tito | Male | 0–1 cm | 14/05/2009 | -25.4 25.7 | 8.5 | 43.6 | 14.7 | 3.5 |
| 13541B | Tito | Male | 1–2 cm | | –25.7 –25.9 | 8.5 | 43.8 | 14.8 | 3.5 |
| 13541C 13541D | Tito | Male Male | 2–3 cm | | -25.9 -26.0 | 8.5 | 43.3 43.0 | 14.4 | 3.5 |
| 13541D 13542/43A | Tito Tito | Male | 3–5 cm 0–1 cm | 15+19/6/2009 | -26.0 -25.3 | 8.5 8.6 | 43.0 42.8 | 14.3 14.5 | 3.5 |
| | | | | 13+13/0/2003 | -25.5 -25.5 | | | | 3.4 |
| 13542/43B 13542/43C | Tito Tito | Male Male | 1–2 cm 2–3 cm | | -25.5 -25.7 | 8.5 8.4 | 42.7 42.6 | 14.4 14.4 | 3.5 3.5 |
| 13542/43D | Tito | Male | 3–4 cm | | -25.7 -25.9 | 8.4 | 42.0 | 14.4 | 3.5 |
| 13542/43E | Tito | Male | 4–5 cm | | -25.9 -26.1 | 8.3 | 42.9 | 13.6 | 3.6 |
| 13342/43L | 1110 | iviale | 4-3 (11) | | -20.1 | 0.5 | 42.0 | 13.0 | 3.0 |
| Unidentified | I Index | Consolo | Hair ra-+ | 11/02/2000 | 26.0 | 0 - | 42.4 | 14.6 | 2.5 |
| 12581A | Unknown | Female | Hair, root | 11/03/2009 | -26.0 25.0 | 8.5 | 43.4 | 14.6 | 3.5 |
| 12581B | Unknown | Female | Hair,middle | 11/03/2009 | -25.9 25.5 | 8.7 | 43.8 | 14.5 | 3.5 |
| 12581C | Unknown | Female | Hair, tip | 11/03/2009 | -25.5 | 8.9 | 43.5 | 14.2 | 3.6 |
| 12581E | Unknown | Female | Hair tip | 10/03/2009 | -26.1 | 8.8 | 45.4 | 14.6 | 3.6 |
| 12582A | Unknown | Female | Hair | 10/03/2009 | -26.3 | 8.5 | 44.5 | 15.0 | 3.5 |
| 12582B | Unknown | Female | Hair | 10/03/2009 | -26.2 | 8.6 | 44.1 | 14.8 | 3.5 |
| 13544A | Unknown | ? | 0–2.5 cm | 01/05/2009 | -25.8 26.4 | 8.4 | 42.5 | 14.4 | 3.4 |
| 13544B | Unknown | ? | 2.5–5 cm | , a (a = /a | -26.1 | 8.5 | 43.5 | 14.3 | 3.6 |
| 13545A | Unknown | ? | 0–2 cm | 19/05/2009 | -26.1 | 8.5 | 42.9 | 14.6 | 3.4 |

Table S3. Cont.

| Sample no. | Name | Sex | Sample section | Date of sampling | δ^{13} C% | $\delta^{15}N\%$ | %C | %N | C:N |
|------------|---------|-----|----------------|------------------|------------------|------------------|------|------|-----|
| 13545B | Unknown | ? | 2–4 cm | | -25.9 | 8.5 | 43.0 | 14.4 | 3.5 |
| 13546A | Unknown | ? | 0–1.5 cm | 06/06/2009 | -25.9 | 8.4 | 41.6 | 14.1 | 3.4 |
| 13546B | Unknown | ? | 1.5–3 cm | | -25.8 | 8.7 | 41.6 | 14.2 | 3.4 |
| 13547A | Unknown | ? | 0–1.5 cm | 07/06/2009 | -25.2 | 8.2 | 41.9 | 14.4 | 3.4 |
| 13547B | Unknown | ? | 1.5–3 cm | | -25.5 | 8.5 | 41.6 | 13.8 | 3.5 |
| 13548A | Unknown | ? | All hair | 20/06/2009 | -25.7 | 8.6 | 42.0 | 13.4 | 3.7 |
| 13549A | Unknown | ? | 1–2 cm | 20/06/2009 | -25.3 | 8.4 | 41.5 | 14.2 | 3.4 |
| 13549B | Unknown | ? | 2–4 cm | | -25.5 | 8.2 | 41.5 | 14.2 | 3.4 |
| 13549C | Unknown | ? | 4–6 cm | | -25.7 | 8.1 | 41.8 | 14.2 | 3.4 |
| 13549D | Unknown | ? | All hair | | -25.9 | 8.1 | 41.7 | 14.2 | 3.4 |
| 13550A | Unknown | ? | 0–2 cm | 22/06/2009 | -26.3 | 8.7 | 42.2 | 14.2 | 3.5 |
| 13550B | Unknown | ? | 2–4.5 cm | | -26.1 | 8.4 | 41.4 | 13.9 | 3.5 |
| 13551A | Unknown | ? | 0–1.5 cm | 22/06/2009 | -25.3 | 8.1 | 41.7 | 14.3 | 3.4 |
| 13551B | Unknown | ? | 1.5–3 cm | | -25.7 | 8.2 | 41.9 | 14.2 | 3.5 |
| 14102A | Unknown | ? | Short hair | 06/07/2009 | -25.4 | 9.0 | 41.4 | 13.9 | 3.5 |
| 14102B | Unknown | ? | 2 hairs | 06/07/2009 | -25.5 | 8.6 | 42.5 | 14.1 | 3.5 |
| 14103A | Unknown | ? | Short hair | 25/07/2009 | -25.2 | 7.9 | 42.0 | 14.1 | 3.5 |
| 14103B | Unknown | ? | 0–2.5 cm | 25/07/2009 | -25.3 | 7.9 | 42.1 | 14.1 | 3.5 |
| 14103C | Unknown | ? | 2.5-5.5 cm | 25/07/2009 | -25.5 | 7.9 | 41.9 | 13.9 | 3.5 |
| 14104A | Unknown | ? | 1 long hair | 08/07/2009 | -25.7 | 8.4 | 41.5 | 13.7 | 3.5 |

Individuals are sorted by sex and name; immature individuals are excluded. The letters following the sample number refer to the number of serial sections made from one sample. The isotope ratios are reported relative to the international standard VPDB (δ^{13} C) and AIR (δ^{15} N).

Table S4. The five most dominant feeding plants for each month from December 2008 to July 2009

| Date | Genus | Species | Plant part unit | Observed days | Feeding days | Feeding/ observation days (%) | δ^{13} C% | δ ¹⁵ N% |
|---------------|----------------------|------------------------------------|--------------------|---------------|-----------------|-------------------------------------|------------------|--------------------|
| November 2008 | Dialium | Dialium sp. | Fruit | 16 | 15 | 94 | -24.7 | 5.1 |
| November 2000 | Polyalthia* | Polyalthia suaveolens | Fruit | 10 | 7 | 44 | 24.7 | 5.1 |
| | Haumania | Haumania leonardiana | Leaves | | 6 | 38 | -33.7 | 4.9 |
| | | | | | 4 | 25 | -33.7 | 4.9 |
| | (Fruit) | (NID tree) | Fruit | | | | 27.1 | F 7 |
| | Pancovia | Pancovia sp. | Fruit | | 2 | 13 | –27.1 | 5.7 |
| December 2008 | Dialium | Dialium sp. | Fruit | 16 | 15 | 94 | -24.7 | 5.1 |
| | Haumania | Haumania Leavesonardiana | Leaves | | 5 | 31 | -33.7 | 4.9 |
| | Parinari | Parinari excelsa | Fruit | | 3 | 19 | -28.5 | 5.7 |
| | (Fruit) | (NID tree) | Fruit | | 2 | 13 | | |
| | Polyalthia* | Polyalthia suaveoLeavesns | Fruit | | 1 | 6 | | |
| January 2009 | Dialium | Dialium sp. | Fruit | 20 | 19 | 95 | -24.7 | 5.1 |
| , | Pancovia | Pancovia sp. | Fruit | | 14 | 70 | -27.1 | 5.7 |
| | Haumania | Haumania leonardiana | Leaves | | 6 | 30 | -33.7 | 4.9 |
| | Uvaria* | Uvaria sp. | Fruit | | 1 | 5 | 33.7 | 1.5 |
| | Ficus | Ficus sp. | Fruit | | 1 | 5 | -30.4 | 7.2 |
| F. J. 2000 | D: !! | D' " | | 40 | 47 | 0.4 | 247 | F.4 |
| February 2009 | Dialium | Dialium sp. | Fruit | 18 | 17 | 94 | -24.7 | 5.1 |
| | Haumania - | Haumania leonardiana - | Leaves | | 9 | 50 | -33.7 | 4.9 |
| | Pancovia | Pancovia sp. | Fruit | | 4 | 22 | -27.1 | 5.7 |
| | (Fruit) | (NID tree) | Fruit | | 3 | 17 | | |
| | Uvaria* | Uvaria sp. | Fruit | | 2 | 11 | | |
| March 2009 | Dialium | Dialium sp. | Fruit | 23 | 23 | 100 | -24.7 | 5.1 |
| | Irvingia | Irvingia gabonensis | Fruit | | 18 | 78 | -26.9 | 6.0 |
| | Haumania | Haumania leonardiana | Leaves | | 16 | 70 | -33.7 | 4.9 |
| | (Leaves) | (NID tree) | Leaves | | 11 | 48 | | |
| | Ficus leaves | Ficus sp. | Leaves | | 3 | 13 | -32.5 | 5.8 |
| April 2009 | Irvingia | Irvingia gabonensis | Fruit | 26 | 17 | 65 | -26.9 | 6.0 |
| April 2003 | Haumania | Haumania leonardiana | | 20 | 16 | | -20.3 -33.7 | 4.9 |
| | | | Leaves | | | 62 | | |
| | Dialium | Dialium sp. | Fruit | | 11 | 42 | -24.7 | 5.1 |
| | Polyalthia* Ficus | Polyalthia suaveolens Ficus sp. | Fruit Fruit | | 8 8 | 31 31 | -30.4 | 7.2 |
| | | • | | | | | | |
| May 2009 | Gambeya | Gambeya lacourtiana | Fruit | 19 | 14 | 74 | -28.4 | 6.6 |
| | Haumania | Haumania leonardiana | Leaves | | 11 | 58 | -33.7 | 4.9 |
| | (Leaves) | (NID tree) | Leaves | | 6 | 32 | | |
| | Ficus | Ficus sp. | Fruit | | 4 | 21 | -30.4 | 7.2 |
| | Dialium | Dialium sp. | Fruit | | 4 | 21 | -24.7 | 5.1 |
| June 2009 | Gambeya | Gambeya lacourtiana | Fruit | 27 | 25 | 93 | -28.4 | 6.6 |
| | Cissus | Cissus dinklagei | Fruit | | 17 | 63 | -27.3 | 2.6 |
| | (Leaves) | (NID tree) | Leaves | | 13 | 48 | | |
| | Haumania | Haumania leonardiana | Leaves | | 9 | 33 | -33.7 | 4.9 |
| | Garcinia | Garcinia punctata | Fruit | | 4 | 15 | -31.6 | 6.1 |
| July 2000 | (Leaves) | (NID tree) | Leaves | 16 | 11 | 60 | | |
| July 2009 | (Leaves) | , | Leaves | 10 | | 69 | 20.5 | r 7 |
| | Parinari | Parinari excelsa | Fruit | | 6 | 38 | -28.5 | 5.7 |
| | Haumania | Haumania leonardiana | Leaves | | 6 | 38 | -33.7 | 4.9 |
| | Dialium | Dialium sp. | Fruit | | 6 | 38 | -24.7 | 5.1 |
| | Gambeya | Gambeya lacourtiana | Fruit | | 5 | 31 | -28.4 | 6.6 |
| | | | | | | Mean | -29.1 | 5.5 |
| | | | | | | SD (1σ) | 3.5 | 0.9 |

The relevance of these plant species [Feeding/observation days (%)] is determined for each month by the number of days the bonobos have been observed eating plants (feeding days) compared with the number of days bonobo feeding events were observed in general (observed days). Some food plants could not be identified (NID).
*Plant not analyzed for stable isotopes.

Table S5. Social rank and age class of male bonobos

| Name | Camillo | Tito | Jack | Dante | Ben | Apollo | Pan | Emil | Max |
|----------------|---------|--------|--------|--------|--------|----------|----------|----------|----------|
| Rank | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Age | Adult | Adult | Adult | Adult | Adult | Subadult | Subadult | Subadult | Subadult |
| $\delta^{15}N$ | 8.69 | 8.47 | 8.19 | 8.79 | 8.41 | 8.06 | 8.15 | 8.33 | 7.86 |
| $\delta^{13}C$ | -25.86 | -25.68 | -25.69 | -25.74 | -25.63 | -25.83 | -25.32 | -25.81 | -25.82 |
| N | 7 | 11 | 3 | 5 | 4 | 6 | 2 | 7 | 5 |

Data are based on Surbeck et al. (1) and on the mean δ^{13} C and δ^{15} N values for N samples as presented in Fig. 4. Subadult individuals are older than 10 y and are sexually active.

^{1.} Surbeck M, Mundry R, Hohmann G (2011) Mothers matter! Maternal support, dominance status and mating success in male bonobos (Pan paniscus). Proc Biol Soc 278:590–598.