LOLLDAIGA HILLS RESEARCH PROGRAMME

NEWSLETTER

Tom Butynski & Yvonne de Jong

January–February 2018 (Issue 17)

Cover photograph: Little Bee-eater *Merops pusillus*, Lolldaiga Hills Ranch. This is one of the six species of bee-eater and 401 species of bird on the Lolldaiga Hills Ranch Bird List. Photograph by Mathew Simpson.

New to lolldaiga.com

- News: First record for Gadwall *Mareca strepera* on Lolldaiga Hills Ranch
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Northern Lolldaiga Hills Ranch. Photograph by Per Aronsson.

News

First record for Gadwall *Mareca strepera* on Lolldaiga Hills Ranch

Tom Butynski, Per Aronsson & Yvonne de Jong, Lolldaiga Hills Research Programme

A solitary adult female Gadwall *Mareca strepera* was observed on Baharini Dam, north Lolldaiga Hills Ranch (N0.29216; E37.13620; 1830 m asl), by Per Aronsson on 14 December 2017. This individual spent more than a month at Baharini Dam where it was photographed by Per Aronsson, Yvonne de Jong, Tom Butynski, and Carly Butynski on 4 January 2018.

Solitary adult female Gadwall *Mareca strepera* at Baharini Dam, north Lolldaiga Hills Ranch (4 January 2018). Photographs by Yvonne de Jong & Tom Butynski.

Gadwall are Palearctic migrants that depend on fresh water dams, lakes, and marshes. Although common in many part of its wide geographic range, Gadwall is a rare species in Kenya with only about five records in during the past 15 years (Brian Finch pers. comm.). This appears to be only the second record for Gadwall east of the Eastern Rift Valley, and the first record for the Kenya Highlands.

The Lolldaiga Hills Ranch Bird List now stands at 401 species. To view this list, go to: www.lolldaiga.com

Blog

Undescribed species and genera of Metarbelidae moths (Lepidoptera, Cossoidea) from Lolldaiga Hills Ranch, central Kenya

Ingo Lehmann, Michael Roberts, Julius Mwenda Mathiu, and Thomas M. Butynski

Moths in the family Metarbelidae are nocturnal, small to medium in size, and usually rare. The majority of species are endemic to areas <50,000 km^2. Sites that have been light-trapped extensively for several years typically yield only 1–4 species of Metarbelidae moth.

No fewer than 217 species and 23 genera of Metarbelidae are known from the Afrotropics (De Prins & De Prins 2016). Until recently, this family has not received much attention (*e.g.*, Lehmann 2013, 2014, Lehmann & Rajaei 2013). Recent molecular research indicates that Metarbelidae originated *ca.* 90–100 million years ago (Wahlberg *et al.* 2013). Morphological data from >570 extant species indicate that Metarbelidae with ancient characters occur only on the Southern African Plateau, particularly south of the Zambezi River (Lehmann in prep.).

Metarbelidae occur from Sub-Saharan Africa, the Comoros Archipelago, and Madagascar, across south Arabia into the Oriental Region (Lehmann in prep.). Metarbelidae are most diverse on the African mainland where about 570 species are known, including at least 105 species in Kenya (Lehmann unpubl. data). These numbers are, however, expected to increase significantly with more research; the total number for the African mainland is expected to exceed 1,500 species with >150 species in Kenya. Hence, Metarbelidae represent a significant element of the fauna of Africa. Diversity in the Oriental Region is relatively low with <100 species in <10 genera (*i.e.*, fewer species than already known from Kenya).

All of the collection sites of the 10 Metarbelidae species presented here (Figures 1–3) are within Lolldaiga Hills Ranch, central Kenya (198 km^2; altitude 1750–2255 m asl; mean annual rainfall *ca*. 620 mm). This ranch is located *ca.* 110 km east of the east escarpment of the Eastern (Gregory) Rift Valley and *ca.* 10 km northwest of the lower northwest slope of Mount Kenya (5,199 m asl). For detailed information on Lolldaiga Hills Ranch, visit: www.lolldaiga.com

Figure 1. Two undescribed 'Afromontane near-endemic' Metarbelidae species captured on Lolldaiga Hills Ranch. These belong to the genera *Metarbelodes* Strand, 1909 (left) and *Mountelgonia* I. Lehmann, 2013 (centre and right).

Figure 2 (left). Six undescribed 'Afromontane linking species' of Metarbelidae in four undescribed genera captured on Lolldaiga Hills Ranch. Top row: male at centre, females left and right; middle row three species with female at centre; bottom row two females of two species.

Figure 3 (below). Two Metarbelidae species with links to the lowlands of eastern Africa and southern Africa captured on Lolldaiga Hills Ranch. Both species are undescribed and belong to undescribed genera.

The northeast, central, and southeast parts of Lolldaiga Hills Ranch were light-trapped for Metarbelidae during February 2016–June 2017. All 10 of the Metarbelidae species trapped were between 1800 and 2200 m asl in cedar-olive dry montane forest in the central part of the Ranch. Here the most common tree species are Africa Pencil Cedar *Juniperus procera*, Wild Olive *Olea europaea africana*, Euclea *Euclea divinorum*, and Poison Arrow Tree *Acokanthera schimperi*. The 10 species found (Figures 1–3) indicate a high diversity of the family Metarbelidae on the Lolldaiga Hills Ranch, particularly in the dry montane forest.

Acknowledgements

We thank Robert Wells and Harry Wells for their hospitality on Lolldaiga Hills Ranch, and Christian Kollhorst (Hamburg) for production of the plates presented here.

References: **De Prins, J. & De Prins, W. (2016)**. Afromoths: online database of Afrotropical moth species (Lepidoptera). Available at: http://www.afromoths.net [accessed 5 August 2016]. **Lehmann, I. (2013).** Description of two new genera and ten new species of Metarbelidae (Lepidoptera: Cossoidea) from western, north-central and eastern Africa with notes on habitats and biogeography. Published by the author, Hamburg. [Available at http://www.biodiversitylibrary.org/bibliography/79421] Accessed August 2016. **Lehmann, I. (2014).** Description of two new genera and two new species of Metarbelidae (Lepidoptera, Cossoidea) from the Northeastern Congolian Lowland Forests Ecoregion (Central Africa). *Zootaxa* 3895 (4): 570–580. **Lehmann, I. & Rajaei, H. (2013)**. Description of a new genus and three new species of Metarbelidae (Lepidoptera: Cossoidea) from East and Central Africa, with notes on biogeography. *Bonn zoological Bulletin* 62 (1): 100–110. **Strand, E. (1909).** Lepidoptera aus Deutsch-Ostafrika. *Deutsche Entomologische Zeitschrift Iris"* 22: 118–121. **Wahlberg, N., Wheat, C. W. & Peña, C. (2013).** Timing and patterns in the taxonomic diversification of Lepidoptera (butterflies and moths), *PLoS ONE* 8 (11) e80875.

Community Development

Bee-keeping and Honey Production Programme on Lolldaiga Hills Ranch: A tribute to David Njuguna

Harry Wells, Lolldaiga Hills Ranch

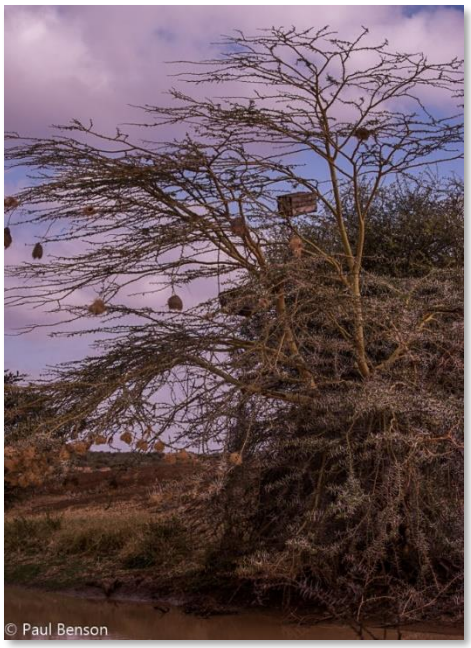
Common Honeybee *Apis mellifera scutellata*, Lolldaiga Hills Ranch. Photograph by Paul Benson.

The Bee-keeping and Honey Production Programme on Lolldaiga Hills Ranch was led by David Njuguna, who over-saw hive construction and management, honey harvesting, and honey processing. Sadly, at the end of August 2017, David lost his life in a vehicle accident. Now, Benson Ngatia (from the neighbouring Makurian Group Ranch) and Moses Lodeiya (who is also a member of the ranch's security team), both of whom worked under David's guidance, co-manage the bee-keeping operation---continuing David's legacy.

Log hives being built and repaired at the base of Ngainitu Hill, Lolldaiga Hills Ranch. Photographs by Paul Benson.

David also assisted communities neighbouring Lolldaiga Hills Ranch, particularly on Makurian Group Ranch and in the Kimugandura area. This included building capacity in bee husbandry, hive management, honey processing, disseminating of information on best bee-keeping practices, pest control, access to markets, and importance of certain plant species for honey production.

David Njuguna (right) inspecting a hive in Laikipia County for Bees Abroad. Photograph from Bees Abroad (http://beesabroad.org.uk/).



Log hives hung in a Yellow Fever Tree *Acacia xanthophloea* to help reduce damage to woodlands by Elephants. Photograph by Paul Benson.

Currently, there are 272 hives on the Ranch: 53 Langstroth hives, 10 box hives, and 209 log hives. In addition, there are 50 catcher boxes. The log hives are carved from the trunks of dead Pencil Cedar *Juniperus procera*. Many of these hives now hang along the Sinyai Lugga in Yellow Fever Trees *Acacia xanthophloea* in order to mitigate Elephant *Loxodonta africana* damage. In recent decades, the woodland along this seasonal river has been severely damaged by Elephants. Bees can be effective in preventing Elephant damage to vegetation (Vollrath & Douglas-Hamilton 2002).

David was a member of the Executive Committee of the Apiculture Platform of Kenya and of the Kenya Bureau of Standards' Apiary Products Technical Committee (which advises the Government of Kenya on standardisation of apiary equipment and products). He attended many workshops and meetings in these capacities while also working with the DFID-funded Bees Abroad Programme.

Box hives hung on Savannah Thorn Trees *Acacia etbaica,* North Gate, Lolldaiga Hills Ranch. Photograph by Paul. Benson.

Local bee-keeping cooperatives were one focus of David's community liaison work. A large proportion of the honey produced on the Ranch (>55 % of the most recent harvest) is sold in bulk to these cooperatives, enabling them to sell it for a profit.

The achievements of the Lolldaiga Hills Ranch's Bee-keeping and Honey Production Programme would not have possible without the expertise, leadership and dedication of David Njuguna. In his memory, Lolldaiga Hills Ranch will continue to expand its bee-keeping programme, improve honey production, and protect plant species important both to honey production and to the maintenance of biodiversity---both on the Ranch and on nearby community lands.

Reference: Vollrath, F. & Douglas-Hamilton, I. (2002). African bees to control African Elephants. *Naturweissenschaften* 89: 508–511.

Project Update

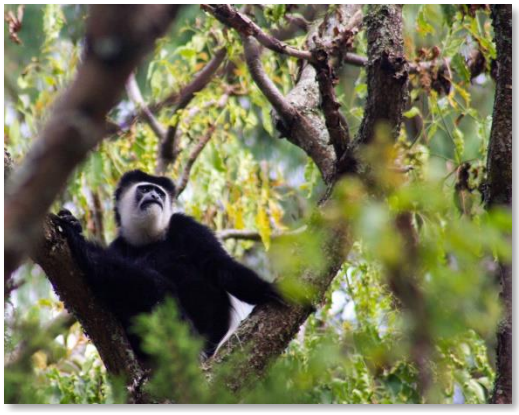
Reintroduction of Guereza Colobus Monkeys to central Lolldaiga Hills Ranch

Yvonne de Jong & Tom Butynski, Lolldaiga Hills Research Programme

In Issue 2 (May 2016) of this newsletter, mention was made of a possible reintroduction of the Mount Kenya Guereza Colobus Monkey *Colobus guereza kikuyuensis* to central Lolldaiga Hills Ranch. During February 2018, a 'Guereza Habitat Suitability Assessment' was undertaken on Lolldaiga Hills Ranch by staff of the Institute of Primate Research (IPR) and National Museums of Kenya (NMK).

The riverine forest of the Timau River (south boundary of the Ranch) supports a small population of Guereza. Due to massive destruction of forest along the Timau River between Mount Kenya and the Ranch, this population is now isolated. Until recently, the only other Guereza on the Ranch were three individuals at Three Rock Dams near the centre of the Ranch). These three Guereza have, however, not been encountered since May 2016. This is believed to be due to the fact that these dams leak. This, in combination with low rainfall during 2016 and 2017, means that these dams have often been dry for long periods. There are now plans to repair these three dams. During the Guereza Habitat Suitability Assessment, the forests around Three Rock Dams, Farm House, Main Farm, and elsewhere on the Ranch were assessed. Guereza occurred at all of these sites within the past 20 years. Their extirpation from these site is thought to be due to the loss of perennial sources of drinking water. The report is expected in early March 2018.

Adult Mount Kenya Guereza Colobus Monkeys *Colobus guereza kikuyuensis* at the Timau River, south Lolldaiga Hills Ranch. Photograph by ZSL/LHRP camera trap.



Adult male Mount Kenya Guereza Colobus *Colobus guereza kikuyuensis* at Naro Moru, central Kenya. Photograph by Yvonne de Jong & Tom Butynski.

The reintroduction of Guereza to several sites on Lolldaiga Hills Ranch, if approved by Kenya Wildlife Service (KWS), will be a joint project of KWS, IPR/NMK, Lolldaiga Hills Research Programme (LHRP), and Kenya National Primate Task Force (of which LHRP is a member). IPR/NMK and KWS have gained considerable expertise in translocating Guereza with the recent successful reintroduction of 135 Guereza to Karura Forest Reserve, Nairobi (visit: http://www.friendsofkarura.org/).

New MSc Thesis

Environmental impacts of red meat production: an analysis in the context of two different livestock value chains in Laikipia, Kenya

Michael Herger, University of Bern, Switzerland

Abstract

Background

In Laikipia, Kenya, livestock production is one of the most crucial food-related activities for habitants and for the condition of the land. Over 2/3 of Laikipia's land is used for livestock keeping under either privately owned large-scale ranching or pastoralist grazing use on non-arable semi-arid and arid rangelands (King et al. 2013). With Laikipia's current economic structure of 80 % of people relying on livestock production, habitants largely depend on natural resources for their livelihood (CAS 2013, Butynski and De Jong 2014). Especially, pastoralists whose subsistence is often solely based on livestock keeping, rely heavily on large and intact rangelands. Thus environmental performance of livestock production is of major importance to enable food sustainability. Laikipia, however, like many other vast land areas in sub-Saharan Africa, is struggling with degraded land. The rangelands of Laikipia experience an increase in bare land and bush since many years (King et al. 2013). Its consequences are far-reaching; threatening the lives of people and livestock (ibid.). Climate change and ever increasing population aggravate the challenges faced. Moreover, livestock numbers are increasing dramatically (they have doubled between 1985-2016), while wildlife is declining recently (Kinnaird et al. 2012). Laikipia's rangelands represent a complex, still poorly understood ecological system that is influenced by past and current social, economic, and environmental dynamics—and by livestock production systems. This study aims at gaining insights into these systems and their environmental impacts to assist in a better management and sustainable use of these vital rangelands.

Bull with Red-billed Oxpeckers *Buphagus erythrorhynchus* in Whistling Thorn *Acacia drepanolobium* woodland on Lolldaiga Hills Ranch, central Kenya. Photograph by Yvonne de Jong.

Goals and methods

Michael (right) and Nicholas (left) assessing top soil properties on Lolldaiga Hills Ranch.

Under these premises, this Master thesis is comparing two major livestock value chains, namely private ranches and Masai group ranches (pastoralists) and their impacts on natural resources and eventually on food sustainability. To tackle the research question, a mixed methods approach was followed. Four ranches - with two different settings of case studies - were characterized, and their value chains of livestock production was reconstructed. For assessing rangeland health, differences in vegetation (species, composition, cover), soil properties (in situ: soil structure, aggregate stability, compaction, edaphon, humus

content; in the laboratory: particle size, total soil organic carbon, total nitrogen, total phosphorus, total potassium, total magnesium, total manganese, total copper, pH), and erosion features were measured.

Results

Results show that livestock production has a decisive impact on the land. The higher the pressure on land, in particular stocking rates, the higher the environmental degradation. Heavy grazing leads to reduced and changed vegetation cover, and thus bare ground, erosion features, and physical and chemical soil degradation. Taking wildlife numbers into account, all ranches exceed carrying capacity. Impact on natural resources mainly takes place in the production step of the value chain. In this step, livestock graze on the vast rangelands. Whereas this only takes place on the ranches for the privately owned type, group ranches (pastoralists) also trek their animals to forest glades for legal and illegal grazing. In Laikipia, major identified ecological problems (partly) caused by livestock production are: bare ground, low contents of soil organic carbon and plant-available nutrients, soil erosion (sealing, crusting, rills and gullies, water flow patterns, sheet erosion, pedestals), poor soil properties, undesirable species, and (increasing) woody and invasive species. These ecological problems are an expression of the environmental performance of livestock production and worsen food sustainability. However, soil organic carbon was clearly above the threshold for healthy plant growth of 5 g kg-1 by the United Nations Convention to Combat Desertification and thus in contrast to other studies (compare Vågen and Winowiecki 2014) not found to be alarming low. This fact, and the mostly good recovery of grasses after rains show that rehabilitation potential is still high. This suggests that environmental degradation is not in an irreversible state. Results also show that management and foremost stocking rates largely influence the state of rangeland. The environmental performance of group ranches is for all assessed indicators worse than of private ranches. A representative indicator is bare ground, showing during the dry season on average alarmingly high 50% of bare ground for group ranches and 13% for private ranches. Soil organic carbon, another representative indicator, resulted in on average 65% higher content for private ranches compared to group ranches. These results, of course, have dramatic implications for what the land provides and how it is protected against erosion. However, results need to be put in context. The integrative design of this study showed that sustainable land management for pastoralists is difficult for many reasons. As the follow-up question is obviously where this high pressure on land on group ranches is coming from. The high pressure on land can be explained by political factors like limiting pastoralist's mobility and available area, cultural and economic reasons such as the risk-averting strategy of livestock keeping and the many thousand livelihoods they support (approximately 8,000 per group ranch), as well as poverty and marginalisation issues.

North Lolldaiga Hills Ranch as seen from Chandler Hill. Photograph by Yvonne de Jong.

Read the full Master thesis on: http://www.lolldaiga.com/environmental-impacts-red-meat/

Publications and Reports

In press

- Butynski, T. M. & De Jong, Y. A. Geographic range, taxonomy, and conservation of the Mount Kilimanjaro Guereza Colobus Monkey (Primates: Cercopithecidae: *Colobus*). *Hystrix*.
- Butynski, T. M. & De Jong, Y. A. Primates of Africa's coastal deltas and their conservation. In: *Primates in Flooded Habitats: Ecology and Conservation*. Barnett, A. A., Matsuda, I. & Nowak, K., eds. Cambridge University Press, Cambridge, UK.
- Butynski, T. M., De Jong, Y. A., King, J. & Ting, N. *Piliocolobus rufomitratus* (Peters, 1879). *IUCN/SSC Red Colobus Action Plan.* IUCN/SSC, Gland, Switzerland.
- Cunneyworth, P., De Jong, Y. A., Butynski, T. M. & Perkin, A. W. IUCN/SSC Red List assessment for Peter's Angolan Colobus *Colobus angolensis palliatus. The IUCN Red List of Threatened Species 2017*. IUCN/SSC, Gland, Switzerland.
- De Jong, Y. A. & Butynski, T. M. Red List assessments for 55 taxa of African primates. *The IUCN Red List of Threatened Species 2017*. IUCN/SSC, Gland, Switzerland.
- Svensson, M. S, Nekaris, K. A. I., Bearder, S. K., Bettridge, C., Butynski, T. M., Cheyne, S. M., Das, N., De Jong, Y. A., Luhrs, A. M., Luncz, L., Maddock, S. T., Perin, A., Pimley, E., Poindexter, S., Reinhardt, K. D., Spaan, D., Stark, D. J., Starr, C. & Nijman, V. Sleep patterns, daytime predation, and the evolution of diurnal sleep site selection in lorisiforms. *American Journal of Physical Anthropology*.

Chandler Hill, east Lolldaiga Hills Ranch, looking southeast towards Mount Kenya. Photograph by Yvonne de Jong & Tom Butynski.

In preparation

- Butynski, T. M., De Jong, Y. A., Oates, J. F. & Brugieri, D. African colobine conservation. In *The Colobines: Natural History, Behaviour and Ecological Diversity.* Matsuda, I, Grueter, C. C. & Teichroeb, J. A., eds. Cambridge University Press, Cambridge, UK.
- De Jong, Y. A. & Butynski, T. M. *Primates of East Africa. Pocket Identification Guide*. Global Wildlife Conservation Tropical Pocket Guide Series.
- De Jong, Y. A., d'Huart, J. P. & Butynski, T. M. Biogeography of the Desert Warthog *Phacochoerus aethiopicus* (Pallas, 1766) and Common Warthog *Phacochoerus africanus* (Gmelin, 1788) in the Horn of Africa.
- De Jong, Y. A. & Butynski, T. M. Biogeography, taxonomy and phenotypic clines of Olive Baboon *Papio anubis* and Yellow Baboon *Papio cynocephalus* in East Africa. Wallis, J., ed. *Baboons*. Cambridge University Press, Cambridge, UK.

Rainfall on Lolldaiga Hills Ranch

Lolldaiga Hills Ranch had no rainfall during January–February 2018.

Super, blood, blue moon rising over Chandler Hill, Lolldaiga Hills Ranch, on 31 January 2018. Photograph by Yvonne de Jong.

Species totals as of end of February 2018

Mammals on the Lolldaiga Hills Conservation Landscape.....106 species
Mammals on Lolldaiga Hills Ranch.....99 species
Birds on Lolldaiga Hills Ranch.....401 species
Birds on the proposed IBA/KBA.....633 species
Reptiles on Lolldaiga Hills Ranch.....33 species
Amphibians on Lolldaiga Hills Ranch.....12 species
Butterflies on Lolldaiga Hills Ranch..... .....135 species
Moths on Lolldaiga Hills Ranch.....>200 species

Except for moths, species list for the above taxonomic groups can be viewed at www.lolldaiga.com

Bat-eared Fox *Otocyon megalotis,* Lolldaiga Hills Ranch. Photograph by Paul Benson.

Best Zoological Society of London/Lolldaiga Hills Research Programme Camera Trap Project photographs on Lolldaiga Hills Ranch (January–February 2018)

North African Crested Porcupine *Hystrix cristata*

Common Duiker *Sylvicapra grimmia*

North African Crested Porcupine *Hystrix cristata*

Striped Ground Squirrel *Xerus erythropus*

Bush Hyrax *Heterohyrax brucei*

Striped Ground Squirrel *Xerus erythropus* and Rock Hyrax *Procavia capensis*

Striped Hyaena *Hyaena hyaena*

African Buffalo *Syncerus caffer*

Aberrant, black-tailed, White-tailed Mongoose *Ichneumia albicauda*

White-tailed Mongoose *Ichneumia albicauda*

Olive Baboon *Papio anubis*

Steenbok *Raphicerus campestris*