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# Of Ants and Elephants: Measuring Student Appreciation for Insects and Charismatic Megafauna During an African Safari

Jeffrey D. Bradshaw and Marlin E. Rice

*“The wild creatures I had come to Africa to see are exhilarating in their multitudes and colors, and I imagined for a time that this glimpse of the earth’s morning might account for the anticipation that I felt, the sense of origins, of innocence and mystery, like a marvelous childhood faculty restored.” – Peter Matthiessen, The Tree Where Man Was Born*

As part of an International Field Trip in Biology class through the Study Abroad Program at Iowa State University, we had as a goal to impress university students of various academic backgrounds with the insects of the Serengeti region in east Africa. The Matthiessen quote hints at our *a priori* expectation and main obstacle—wondrous distraction. The promoted goal of the field trip was to educate and expose students to the natural history of northern Tanzania, with a focus on the mammalian and avian fauna, the varied grassland-bushland-montane forest ecosystems, Rift Valley geology, and Maasai culture. The course, conducted during 2005, consisted of 16 weekly, in-class lectures followed by a three-week safari in northern Tanzania to Serengeti, Tarangire, Lake Manyara and Arusha national parks, Ngorongoro Crater Conservation Area, and Lake Natron. The class demography included an instructor (MER), a teaching assistant (JDB), and 16 students representing seven majors (Table 1). We expected that students would be so amazed at experiencing an environment with such a diverse and abundant charismatic megafauna that introducing insects to them (none of the students was an entomology major) would prove an interesting challenge. We established a hypothesis that the relative desirability or appreciation of insects (or arthropods broadly) to non-entomology students would not be changed substantially by a biology field trip to Tanzania.

During the first semester lecture, the 16 students were given a written survey consisting of 25 Tanzanian animal species (listed in alphabetical order) likely to be observed during the field trip (Table 2). Students were asked to rank the species based on their expected desirability (i.e., those species they wanted to observe and experience). At the conclusion of the three-week field trip, the survey was given again and the pre- and post-field trip ranks compared. We were surprised by what the surveys revealed; however, we did not leave the students’ entomological experiences to chance while we were on safari.

During our field trip, we took advantage of opportunities when they arose to expose students to arthropods. However, opportunities generally were rare because of several ecological limitations and logistical restrictions. We were in Tanzania for a short duration, and the field trip occurred at the beginning of

the dry season, when insect abundance and diversity were noticeably reduced. Blacklighting was generally poor because several locations were at high elevations (Ngorongoro Crater at 2,270 meters and Serengeti at 1,630 meters) with cool evenings.

Our group traveled in three vehicles and we were occasionally separated. Park restrictions severely limited when and where students could get out of vehicles, and the expectedly uncompromising threat of the roaming megafauna (such as lions, hyenas, elephants, and Cape buffalo) greatly limited the distance students could venture into the bush adjacent to the tents and lodges where we stayed. Nevertheless, student encounters with arthropods either arose fortuitously (or unfortunately, depending on a student’s perspective) or were pointed out by us during the field trip and included butterflies nectaring, climbing on termite mounds, manure flies associated with the prolific dung from the immense herds of wildebeest and zebra, raiding army ants, swarming African honey bees, blacklighting for scorpions, finding wolf spiders at night by shining flashlights into their eyes, dung beetles working in elephant manure, thorn gall acacia ants, large wall spiders or armored ground crickets crawling inside of the tents, and biting mosquitoes and tsetse flies. Encounters with several of these arthropods were generally unwelcome. A collection of verbal comments reveals that many arthro-

**Table 1. Majors of students enrolled in Biology 394, International Field Trip in Biology, Iowa State University, 2005.**

Major	N <sup>a</sup>
Zoology	6
Animal Ecology	4
Animal Science	3
Biology	2
Pre-Veterinary Medicine	2
Genetics	1
Non-degree	1

<sup>a</sup> Of the 16 students enrolled some had dual majors.

**Table 2. Species, median ranks, and change in median rank of select African fauna surveyed for student desirability or appreciation<sup>a</sup>. Rows are species ranked in descending order of pre- and post-field trip differences.**

Species	Pre-field trip <sup>b</sup>	Post-field trip <sup>b</sup>	Change (Pre-trip minus post-trip)
wildebeest	15.0	8.5	6.5
army ant	22.7	18.2	4.5
Cape buffalo	15.3	11.9	3.4
hyena (spotted)	12.7	9.9	2.8
African elephant	7.9	5.3	2.6
dik-dik	14.7	12.4	2.3
warthog	15.1	13.8	1.3
hartebeest	17.9	16.6	1.3
zebra	9.9	9.4	0.5
scorpion	21.4	21.0	0.4
giraffe	5.9	5.6	0.3
hippopotamus	7.9	7.7	0.2
baboon	10.5	10.4	0.1
cheetah	5.7	5.7	0.0
termite	21.8	21.8	0.0
vervet monkey	12.6	12.9	-0.3
mongoose	15.2	15.6	-0.4
Thomson's gazelle	15.1	15.6	-0.5
impala	16.2	16.8	-0.6
lion	5.3	7.1	-1.8
ostrich	14.2	16.4	-2.2
Nile crocodile	13.8	17.4	-3.6
python	17.0	21.8	-4.8
leopard	6.5	11.6	-5.1
black rhino	4.9	11.3	-6.4

<sup>a</sup> n=16 for both surveys.

<sup>b</sup> Large values indicate less desirability or appreciation while small values indicate greater desirability or appreciation.

pod experiences, although memorable, were less than endearing to the students:

"Today has been a horrible day—bugs landing on my face and sucking my will to live."

"I don't know what it was, but it had many legs and it did not feel good."

"I was just held hostage by a big spider in our bathroom."

"That's the most disgusting thing I've ever seen—it totally creeped me out."

"I finally reached my breaking point. I'm starting to hallucinate about spiders in the shower."

"I hated all the insects. I had a giant dung beetle fall right onto my playing cards."

In contrast, positive comments about arthropods were generally scarce, but army ants (*Dorylus* sp., also known as driver ants



**Fig. 1.** Wildebeest and zebra were perceived favorably during the field trip, even though hoards of annoying "manure flies" that landed on our arms and faces emanated from their massive quantities of dung. Western Corridor, Serengeti National Park, Tanzania. (Photo by Marlin E. Rice)

or safari ants), butterflies, scorpions, and wolf spiders all received positive mention in the written evaluations or from casual verbal comments made by the students. In Arusha National Park, we observed a large "melody" of 12 butterfly species nectaring on flowers in a forest opening, and one large mother-of-pearl butterfly prompted a student to remark, "Wow! That's the coolest butterfly I've ever seen in my entire life."

The post-trip survey results were equally interesting. The change in desirability or appreciation for the listed wildlife increased for 13 species, decreased for 10 species, and did not change for two species (Table 2). We were successful in observing, in varying numbers, all of the listed wildlife except for the python, although we did observe a very large forest cobra. On the survey, some students probably thought that a snake is a snake, regardless of the species, and voted accordingly. However, in the case of termites, we saw only their mounds. We found one 12-foot tall termite mound that we explored and some students climbed. Based on student responses, we believe the change in rank of the observed wildlife was apparently due to four factors: 1) the initial expectations of the student, 2) the number of individuals of a species observed, 3) the physical closeness or proximity of the species, and 4) the exhibited behavior of the species during observation. Several charismatic species, such as the black rhino and lion dropped in rank, possibly because we observed only one rhino at a distance and the lions, although abundant (we saw 21 one day), typically spent an inordinate amount of time sleeping. In contrast, African elephants

increased in rank; their social behavior, constant activity, and indifference to our presence (sometimes walking to within 7-8 meters of our vehicles) made them a favorite with the students.

Given these factors and by measure of our survey, of the three arthropods (army ant, scorpion, and termite), only the army ant increased appreciably in rank with respect to desirability or appreciation (Table 2). In fact, after the wildebeest (which were impressive due to their massive numbers, bellowing grunts, male head butting, and migrating behavior), the army ant had the second largest increase in rank (=4.5). On the jungle-covered slopes of Ngorongoro Crater, we were able to witness a raiding column of army ants swarming across an open path for about 10 minutes. We, and three other class members, decided after much hesitation and with great apprehension, to stick our very vulnerable fingers into the edge of the raiding column and allow ourselves to be bitten. The major soldiers quickly recognized the intrud-



**Fig. 2.** Many arthropods, such as this armored ground cricket, were viewed unfavorably by students, especially when they occurred in living quarters. Harare, Zimbabwe. (Photo by Marlin E. Rice)



Fig. 3. Some students, such as Matt Wihlm, appreciated the African arthropod fauna. Giant dung beetle, Tarangire National Park, Tanzania. (Photo by Marlin E. Rice)

for an indelible memory. It also impressed the student spectators when they saw our anguished expressions and the flow of blood. One student remarked on his post-trip survey that he had ranked the army ant as number one because during the safari "it was the only animal that made me bleed!"

This biology field trip to east Africa provided evidence that even during a short study-abroad experience, the relative perspectives of arthropods to non-major stu-


dents can be changed, and even improved, when opportunities for insect and human interactions are embraced, understood, and most of all, appreciated.

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Fig. 4. The ferocity and numbers of army ants, *Dorylus* sp., gave many students a positive and lasting impression. Ngorongoro Crater, Tanzania. (Photo by Marlin E. Rice)

Jeffrey D. Bradshaw graduated from Iowa State University in 2007 with a Ph.D. and co-majors in Entomology and Plant Pathology. His primary research has focused on ecology and management of bean leaf beetles and bean pod mottle virus. Marlin E. Rice is a Professor of Entomology at Iowa State University with extension and research responsibilities for field and forage crop insects. He taught the class, "Natural History of the Serengeti," during 2002, 2005, and 2007, and has shared the African experience, entomological and otherwise, with 54 students. 

ers and bit down hard, rocking their massive heads from side to side while alternately forcing each slender mandible deeper and deeper into our flesh. The ferocity and pain of the ant bite did not disappoint—it made

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