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BIODIVERSITY & ENVIRONMENT AFRICA

VIEWPOINT

CAPTIVE LIONS & CANNED HUNTING

BIODIVERSITY FOCUS

LIONS

HEALTH & WELLBEING

CHOCOLATE - food of the gods

Cover image: *Panthera leo* -Lion

Photo: Warren Schmidt

MISSION

Biodiversity & Environment Africa (publication) strives to present accurate and informative news on relevant biodiversity and environmental topics from across the African continent. We aim to disseminate academic research findings and communicate this in an informative and understandable format to our readers, as well as highlighting important **conservation and environmental issues.**

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IN THIS ISSUE

Approaching wild, untamed lions along the Olifants River adjacent to the Kruger National Park.

Captive Lions & Canned Hunting –is it over?

In 1999 we were camping at one of the rest camps in the Kgalagadi Transfrontier Park with no one else in sight. We pitched the tent a few metres from the meagre perimeter fence. It was in the early morning hours when I woke, sensing a primal presence lurking in the darkness. I could hear the breathing and footsteps outside —above the echo of my pounding heart. Intently concentrating, I was about to exit the tent with my torch to investigate, when a mighty guttural roar split the silence of night and reverberated through to the furthest chambers of my soul and consciousness, leaving me frozen solid, my mind struggling to make sense of what I had just heard. It felt like the lion was inside the tent with me. The mighty roar repeated and suddenly the thin nylon fabric of the tent felt utterly defenseless against the mighty predator outside. I held no confidence in the wire fence strands that separated the lion from the vulnerable humans inside. Fortunately, this big male had other matters to contend with, and vanished into the darkness.

My prior introduction to lions were through the books of Peter Hathaway Capstick - *Death in the Long Grass* and *Death in the Silent Places* and *Maneaters*, as well as *The Man-eaters of Tsavo* by Lieutenant-Colonel John Henry Patterson, who gave a chilling and vivid account of two lions that allegedly killed over 100 people (although other sources state 30), mostly railway workers, who were constructing the railway bridge over the Tsavo River in Kenya.

It would be almost two decades later when I would experience another close lion encounter, despite numerous interim sightings from the safety of a car or game vehicle in national parks and game reserves. In October 2019, I accompanied two seasoned guides and a trainee guide on a bush walk next to the Olifants River bordering the Kruger National Park. Our objective was to approach a small pride of lions on foot so that the trainee guide could log more hours tracking dangerous animals. The lions included a young male accompanied by two young fit females. As we approached, they cautiously eyed us, stood up and walked away into dense riverine bush. We proceeded to follow them but one of the females doubled back, coming above us on a raised embankment. We couldn't see her as we made our way up, and in a blurred second she charged while one of the guides chambered the rifle with split-second reflexes. The bolt-action sound fortunately stopped the lioness in her tracks, and she quickly vanished into the thicket, a cloud of dust hanging in the air —the only evidence of what

>>>>>>>>>>> *continue to page 4*

had just occurred. We decided that discretion was the better part of valor and moved away in the opposite direction, constantly looking back to find the lions watching us intently. I was elated. The charge was so fast that my adrenal glands had little time to react, and my mind only replayed the encounter later that evening.

The Kalahari experience and lowveld encounter sits at the heart of what makes 'Africa' —Africa. As the birthplace of humankind, lions and people have co-existed for hundreds of thousands of years. The roar of a lion is encoded deep in our genes and brings out every heightened sense to its extreme pinnacle throughout our mortal body. I hope that generations ahead will still get to experience the thrill of the real wilderness. And this brings us to the topic at hand. Captive lions and canned hunting.

The range of lions historically expanded from Cape Town across most of Africa, and into the Middle East, Arabia and Asia, where today a small population survives in the Gir Wildlife Sanctuary in western India. During Roman times, lions were caught, tamed, beaten, chained, displayed, and made to perform in circuses and amphitheaters, where public executions were carried out using lions and other big cats, in an act called *damnatio ad bestias*, Latin for "condemnation to beasts". Throughout the centuries people have continued to be entertained through zoo displays, travelling side-shows and circuses. Fortunately, these dismal attractions are becoming increasingly rare.

For the record, I am not opposed to ethical wildlife hunting and zoological gardens, as I believe that both sectors have made a considerable contribution to wildlife conservation and education. Zoological gardens across the world continue to do a sterling job in breeding critically endangered species (*ex situ* conservation) and provide many urban communities with the chance to engage with wildlife and provide educational opportunities about imperiled natural areas. But in both the game ranching industries and captive facilities, there are those whose sole purpose is exploitation of wildlife for profit.

The canned lion debate has raged on now for the better part of a decade, and this debate has often become heated, pitting animal rights activists and welfare organisations against those that keep and breed lions and other big cats in captive situations. Some of these facilities offer the experience of petting a captive-bred lion cub or "walking with lions" as part of an eco-tourism experience. Investigations have revealed that the destiny of many of these lions is to end up being released into hunting concessions where they are hunted with little or no chance of escape, and being somewhat domesticated —having little fear of the humans hunting them. Others end up supplying lion bone to Asian markets for traditional medicines.

Recently, the Department of Forestry, Fisheries and the Environment released a High-Level Panel report on the management, breeding, hunting, trade and handling of elephant, lion, leopard and rhinoceros. This report follows on from a Colloquium on Captive Lion Breeding held in 2018, in which it was recommended that an end to captive lion breeding be implemented. This report is awaiting endorsement from parliament, but there is still a long road ahead. Given the number of captive lions in various places, how will the welfare of these animals be taken care of, including feeding? And what will happen to all these animals? There are still numerous legal hurdles to overcome.

At the time of writing, I have only glanced over the report, and thus need to give it the attention it deserves. However, my greatest concern is that it gives a broad overview of the situation —but offers no insight or directives as to how the captive lions, or canned hunting, will be managed and regulated, and the timeframe involved. There seems to be glaring uncertainty as to the road ahead. Although Section 9 gives recommendations, i.e., guiding vision and principles, these are largely focused on the wildlife economy at large, and the inclusion of previously disadvantaged minority groups into the sector, but steers clear of explicitly stating how captive and or, privately-owned lions, elephants, and rhinos will be managed. My experience over the years is that South Africa is excellent at producing volumes of reports, papers, white papers, legislation, recommendations and additional reports following further stakeholder engagements… but these processes often result in very little action being taken on the actual ground. We can only wait patiently for the outcome and hope that the animals involved reap the benefits. And most importantly, that the rampant poaching of wild rhino, pangolins, and other wildlife species is tackled with equal fervor and commitment.

The security of private ownership of species like rhino should be carefully weighed up against state sanctuaries who are losing the fight around protecting these iconic species in so-called protected reserves. The issues are complex, but it remains to be seen how this High-Level Panel report will play out to the benefit of all South Africans, the species involved, and how it shall be extended to Africa as a whole. We plan to look into this in more detail in forthcoming issues.

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Report: The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, Breeding, Hunting, Trade and Handling. High-level panel report – for submission to the minister of Environment, Forestry and Fisheries. 15 December 2020. 582pp.

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Lions

Text and photos: Warren Schmidt

Often one of the most sought-after animals alongside rhino, leopard and elephants in national parks and game reserves, the lion has fascinated humankind for thousands of years. Unfortunately, they have also been persecuted and exploited for equally as long. Tragically, without radical conservation actions, they may become nothing more than archived photographs and dusty museum displays in the next few decades.

The lion was designated its formal scientific name by Linnaeus in 1758, Panthera leo. Panthera stems from *panther* – a cat and *leo* from the Greek name for lion. Several subspecies have been proposed but not accepted by many mammologists or taxonomists.

Historical Range

Around 15-20 thousand years ago lions were widespread across Africa, Asia and even throughout much of North America. The North American population was referable to the North American lion *Panthera leo atrox* and vanished around 11 000 years ago. The Beringian Lion *Panthera leo vereschchagini* occurred in the Bering Strait – the land bridges between Asia and North America. The Eurasian Cave Lion *Panthera leo spelaea* was found across most of Asia and Europe. Modern lions, *Panthera leo leo* are found across Africa, and historically the Middle East and southern parts of Europe. However, the relationships and taxonomy of these extinct lion lineages to modern-day lions remains unclear. For an interesting overview of current understanding of the phylogeography and historical ranges of lions, Ross Barnett and colleagues discuss the genetics in a paper published in Molecular Ecology in 2009 (referenced below).

The last remaining modern lions in Europe are believed to have become extinct in Greece around 100 AD. They were found in the Middle East until around the twelfth century and were largely extirpated from North Africa by the 1940s. Likewise, lions were found across South Africa, and known around Cape Town during the 1600s and 1700's. As settlers and livestock moved inland, the lions steadily disappeared as a result of hunting and persecution. They all but vanished from most of the Eastern, Western and Northern Cape, as well as the Free State and KwaZulu-Natal. The only populations surviving were those in protected reserves in northern KwaZulu-Natal and in patches of the lowveld and adjacent Mozambique.

Current Range and Conservation Status

Lions are currently found across far northern Namibia and much of Botswana, northern Zimbabwe and the north-eastern parts of South Africa where they exist in game reserves and national parks. They have a patchy distribution in Angola, Zambia, Malawi and Mozambique. Due to decades of civil war, the distribution and population density of lions in Angola and Mozambique remain unknown.

They occur widely in Tanzania and Kenya, both inside and outside of national parks. A few are also found in Somalia, Uganda, Rwanda, Burundi, and Ethiopia, and across some parts of Central and West Africa.

Boundary fences in national parks are not always escape-proof and lions are known to get out and some can travel vast distances,

especially at night. Lions are frequently encountered around the outskirts of the Kruger National Park near towns like Phalaborwa and Hoedspruit. A few individuals were seen near Louw's Creek south of Kruger in the 1980s and 1990s.

The lion is listed on the IUCN Red List as Vulnerable as populations continue to decline. A recent paper discussing human-wildlife conflict with lion and elephant (Enrico Minin and colleagues, referenced below), showed that 82% of sites which had lions and elephants were adjacent to areas experiencing considerable human pressure. The authors also divided the African continent into four sections and gave lion population estimates: West Africa – 463 lions; Eastern Africa – 12 944 lions; Central Africa – 1 405 lions and Southern Africa – 10 314 lions. Give or take averages either way, the entire wild lion population on the African continent is less than 30 000 individuals. Given the rapid human population growth in sub-Saharan Africa, lion populations may well continue declining to the point where genetic isolation, or bottlenecks, could rapidly lead to their extinction within the next few decades.

Description

Lions are sandy brown in complexion and paler underneath. Cubs and youngsters usually have distinct darker patches or rosettes which fade as they mature, but some adults retain this pattern. Interestingly, lions have a sharp spur on the tail tip which is covered by a tuft of course black hair. The reason for this spur is unknown. The back of the ears are also black in colouration. Adult males have a characteristic mane of golden-brown hair which may darken as the lion grows older. A few populations are very pale, almost white in complexion, particularly lions from Namibia and Botswana. However, the famous "white lions" of Timbavati also have a near white coat, which is caused by a recessive gene in the population.

Adult lions have a body length of 2,3 to 3,3 metres with males being larger and bulkier, and a shoulder height of up to 1.2 metres in males. Weight of females between 110-152 kg and males 150-225 kg. One of the heaviest males recorded was shot near Mount Kenya and weighed 272 kg.

Hunting and Prey

Lions are among the few cats that hunt socially. In established prides, it is usually the adult females that engage in hunting. Lions are superb stalkers and when suitable prey herds are detected, they begin stalking their prey. They remain close to the ground with eyes fixed on their intended target. Most chases are of a short duration and usually no more than 200 metres distant. A truly astonishing feat is that lions can cover a distance of 100 metres in around six seconds!

In the savanna ecosystems, impala, warthog, zebra and blue wildebeest make up a fair proportion of prey. Lions are very versatile when it comes to prey and it is largely dependent on what is available in a given environment and seasonal abundance. In the western arid regions, springbuck and gemsbok make up a substantial portion of prey. Lions in Namibia's West Coast National Park regularly prey on seals. They will also take a wide variety of smaller prey species, including hares, springhares, pythons, aardvark and even porcupines.

In established prides, it is usually the adult females that engage in hunting.

Adult males have a characteristic mane of golden-brown hair which may darken as the lion grows older.

Some prides become specialists at killing certain species. In Botswana, some prides specialise in hunting elephants.

Most hunting takes place at night, especially on dark nights and rarely when there is a full moon. They will also hunt during the day when it is cool and overcast. Feeding at the kill has a clearly defined social hierarchy whereby the males have first feed, followed by the females. The younger cubs have a tough existence and usually get the leftovers. As a result, starvation is frequently observed in young lions and mortality is high, especially when prey is scarce or difficult to hunt.

Tracks in the sand – lion spoor.

Social Life

Lions form prides of between 3-30 individuals, mostly made up of related females, their cubs and one or two adult males. However, pride dynamics change frequently. Pregnant females leave the main pride to give birth and where several lion prides and ousted males exist within a territory, aggressive interactions are commonplace. Pride takeovers by males often result in fights between the dominant males, and if an established male is ousted, his cubs are often killed by the new arrival.

Mating and Gestation

Lions breed throughout the year, but breeding success is largely dependent on environmental factors, especially food availability. The gestation period is around 110 days, and 1-4 cubs are born, rarely up to six cubs. Females move away from the pride to give birth and remain hidden for several weeks before re-joining the pride with their cubs.

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Food of the gods, WORK OF HUMAN HANDS

The story of chocolate is often shrouded by romantism, yet it unfolds through somewhat controversial twists and turns. As we peer into the biodiversity of fermenting microbes that almost magically come to create its unique array of regional flavours, our eyes come to widen further. Within this dynamic milieu emerges a darker reality. One centres around the socio-economic plight of subsistence farmers and child labourers, and another tells itself from within the insect pollination crisis -where we find the wild yet vulnerable cacao tree. Next time one takes a bite, may there be greater reverence for what trails beyond the shiny allure of a tinsel wrapper… be it for health or pleasure.

Magic of Fermentation

" This is the power of fermentation: to change, convert, transform. It takes the usual and makes it unusual – thanks to the magic of microbes."
Source: https://theconversation.com

There is more to chocolate than meets the eye, or should we say…tastebuds. The life of chocolate has its genesis in the seeds of the football-shaped pods of fruit born of tiny flowers growing off the trunk of the *Theobroma cacao* tree, literally translated as 'food of the gods'.

The transformation of these seeds to chocolate was discovered 3900 years ago by the Olmec people of Central America. The multi-step process involves today's workers cracking open the brightly coloured fruit and removing the seeds and pulp. The seeds are then referred to as cacao beans and are cured and drained over a period of 3 to 10 days before they are put under the sun to dry. They are then roasted and crushed with sugar, and often dried milk, to make a variety of chocolate products for the international marketplace.

It is during the curing stage that cacao fermentation takes place, another one of nature's secret dances of life. At the heart of this chemistry, are millions of microorganisms at work. Invisible to the naked eye, it is thanks to these biological players and how they influence the taste of the beans that we can ultimately appreciate the final chocolate. Chocolate's flavour is thus genuinely complex and consists of hundreds of individual compounds which stem from the fermentation process. It is a wild fermentation characterised not only by each farmer's particular method, but also by the hot, humid equatorial landscape, where these wild microbes inhabit. This is a phenomenon called "terroir".

Crafters of gourmet small-batch chocolate based on hand select beans delivering their own distinctive terroir and flavour nuances confirm an old proverbial truth: 'less' is 'more'.

Powerhouse of Healthy Nutrients

Improves mental function & wellbeing

If you look at the basic components of chocolate, you'll find that it's bursting with antioxidants and has been used in traditional medicine throughout South America for hundreds of years. Raw cacao contains antioxidants as well as a bounty of electrolytes and minerals such as potassium, iron, zinc, and magnesium, and has been shown to improve mental function and emotional wellbeing. Dark chocolate stimulates the production of endorphins, chemicals in the brain that create feelings of pleasure. Dark chocolate also contains serotonin, a hormone that elevates mood and has long been a popular winner for PMS (premenstrual syndrome) in this respect!

Good for Digestion

The fibre in cacao powder promotes healthy digestion and can reduce the risk and symptoms of irritable bowel syndrome and digestive complaints. Furthermore, being a fermented food,

unrefined chocolate is also good for your gut microbiome.
Considering the types of chocolate available, the probiotic cells remain highest in dark chocolate (50% cocoa and higher). Dark chocolate is 'superhero league' chocolate because it possesses both pre- and pro-biotics in every bite. Let us explain what a prebiotic and probiotic food is: prebiotics feed the friendly bacteria you already have in your colon, and probiotics add new friendly bacteria to the already existing micro-ecology alive in your gut. The latter carries out the important role of immune protective work, producing certain vitamins, and communicating with good bacteria in other parts of your body.

Helps to Lower Blood Pressure

Unrefined cacao powder is packed with flavonoids. These nutrients have been shown to help lower blood pressure and improve blood flow to the brain and heart, as well as aid in preventing blood clots.

May Lower Diabetes Risk

The flavonoids in cacao powder may help increase insulin sensitivity thus reducing your risk of diabetes.

Reduced Heart Disease Risk

Cacao powder contains lots of potassium. Potassium has been shown to decrease the risk of heart disease by reducing inflammation and stress on cells. https://www.webmd.com/diet/health-benefits-cacao-powder#1

A Puzzle of Pollination

Prof. DeWayne Shoemaker works for the University of Tennessee Institute of Agriculture as an entomologist and studies cacao pollination. He accounts how the current sustainability of cacao appears to depend on several species of very small fly pollinators struggling to 'get the job done'.
https://theconversation.com/tiny-cacao-flowers-and-fickle-midges-are-part-of-a-pollination-puzzle-that-limits-chocolate-production-154334

Today cacao is grown in equatorial regions around the world, including western Africa and several tropical regions in Asia. Each flower growing directly on the trunk or large branches of the cacao tree, *Theobroma cacao*, requires pollination to successfully produce fruit pods (almost the size of an American football), containing 30-60 seeds in each pod, which can be processed to make chocolate.
Scientists don't fully understand cacao pollination. Even though over 50 million people worldwide depend on chocolate for their livelihood. In today's day and age, cacao pollination is problematic in many regions. An estimate of only up to 10%-20% of the flowers produced by a cacao tree are successfully pollinated. The remainder, something like 90%, never even receive any pollen at all –or at least not enough pollen to create fruits. Many cacao trees are unable to self-pollinate, they are dependant on certain insects to conduct this vital task.
https://theconversation.com

A big job left to a little fickle fly...

"Humans like to think we run the world, believing in our omnipotence. But while we shape and engineer — make, muddle and destroy — we are not, according to scientists, the world's ultimate controllers. That role clearly falls to insects, 'the little things that run the world,' as E.O. Wilson, the world's pre-eminent entomologist, told us back in 1987." https://news.mongabay.com/2019/06/the-great-insect-dying-a-global-look-at-a-deepening-crisis

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"Think of a meal reduced to wind-pollinated crops — the bread will stay, [but] fruits and vegetables and most of the meat will be gone," says Axel Ssymank an entomologist with the German Federal Agency for Nature Conservation, who pointed out, for example, that cocoa is 'exclusively dependent on the pollination of small midges.' Imagine: a world without these unsung, unseen midges is a world without chocolate — forever."
Biting midges from the Ceratopogonidae family and gall midges from the Cecidomyiidae family are among the most important known cacao pollinators worldwide. ***"We may not always see or understand the intricate ways that [insects] pull and hold ecosystems together, but we know enough to understand that even if we don't see those roles … they're key,"*** says Michelle Trautwein, an expert on flies and assistant curator of entomology with the California Academy of Sciences.
Source: https://news.mongabay.com/2019/06/the-great-insect-dying-a-global-look-at-a-deepening-crisis

One can definitely hear the 'chocolate and midges story' resonate within a greater context when we look at the following New York Times Magazine story, "The Insect Apocalypse is Here", by Brooke Jarvis at the end of 2018. The German research demonstrated that the abundance of all flying insects — wasps, flies, butterflies, bees, dragonflies, beetles, etc., etc. — had fallen more than drastically.
The study did not provide a clear explanation as to why this dramatic occurrence is happening, but scientists are convinced that the precipitous decline is connected to the intensification of agriculture, (including a loss of wetlands), as well as habitat loss and use of pesticides. The researchers haven't pointed huge blame towards climate change, although others have, especially in the tropics. On the other side of the debate however, numerous entomologists say that humans will go extinct long, long before all insects do.
https://news.mongabay.com/2019/06/the-great-insect-dying-a-global-look-at-a-deepening-crisis/

We seem to see no end to the ecological damage and fragility forming the framework around the supply of and demand for cacao. The unsatiable global demand for chocolate has long been documented revealing the destruction of forests, like in the heart of Ivory Coast.
https://www.theguardian.com/world/2017/sep/13/deforestation-ivory-coast-trees-chimpanzees-make-way-cocoa

Work of Human Hands

From Africa to the Global North

The next story that is found to be interwoven with chocolate bears heavily on the humanitarian front. Cacao trees like the hot humid climate that exists in the tropical regions of the Equator. Roughly 70 percent of the world's cocoa is grown in West Africa. This is shared by four West African countries: Ivory Coast, Ghana, Nigeria and Cameroon. The Ivory Coast and Ghana are by far the two largest producers of cocoa. Together they cultivate more than half of the world´s cocoa, followed by other cocoa producing countries like Indonesia, Nigeria, Cameroon, Brazil and Ecuador. Back in 2015, 90% of cocoa was generally grown on small family farms. Now, this is almost a personal affair, since only about 5% comes from large plantations of 40 hectares or more. More than 5 years ago, cocoa production provided a source of income for between 40 and 50 million farmers, rural workers and their families in the Global South. In the Ivory Coast and Ghana, up to 90% of the farmers rely on cocoa for their primary income.
https://makechocolatefair.org/issues/cocoa-production-nutshell

Like most subsistence farming, it is hard manual work and extremely labour intensive. It takes a whole year's crop from one tree to make half a kilo of cocoa. As pods do not ripen at the same time, the trees need to be monitored continuously. Cocoa is also a very delicate crop, easily affected by changes in weather and susceptible to diseases and pests. After the harvest, the ripe pods need to be cut open with machetes and the beans taken out. The cocoa beans then need to be fermented, dried, cleaned and packed. When the beans are packed into cocoa sacks, the farmers are ready to sell the product to intermediaries. It is then sold to exporters, and then thereafter to the grinding companies and chocolate manufacturers in the northern hemisphere. Here, cocoa liquor is made, or the cocoa is further processed to produce cocoa butter or powder. https://makechocolatefair.org/issues/cocoa-production-nutshell

The screaming message to highlight here is that extreme poverty is the norm for West African cocoa farmers. Directly parallel to this scenario is a cocoa supply chain increasingly dominated by a select group of large corporations. That is why the campaign "Make Chocolate Fair!" demands a living income for cocoa farmers, as well as a voice in the debate, and a more responsible value distribution in the supply chain.
https://makechocolatefair.org/news/despite-increase-certified-chocolate-cocoa-farmers-continue-live-extreme-poverty

Low earnings for cocoa farmers -no future

At the time of writing, which is way back in 2015, West African cocoa farmers lived well below globally

defined poverty levels. In Côte d'Ivoire – the world's largest producer of cocoa – a farmer should have been earning four times his current income in order to reach the global poverty line of $2 a day. To achieve a level sufficient to cover basic needs (a living income), this would probably need to be a lot higher. The lack of a decent livelihood for cocoa farmers leads to bad labour circumstances, human rights violations, and many other problems in the cocoa supply chain, not excluding the serious issue of child labour. Cocoa no longer offers a worthwhile future. More and more, younger generations of cocoa farmers are moving away from cocoa, and older farmers are coming to the end of their farming life expectancy.
https://makechocolatefair.org/news/despite-increase-certified-chocolate-cocoa-farmers-continue-live-extreme-poverty

Market concentration too high

An unfair distribution of value and power in the cocoa chain are part of the root causes of extreme poverty for cocoa farmers. Mergers and takeovers have resulted in just a few companies dominating up to 80% of the whole value chain, while farmers lack a sufficiently organized voice to be strong enough actors. Chocolate manufacturers, in particular, as well as retailers, gain a lot in comparison to the other stakeholders.
https://makechocolatefair.org/news/despite-increase-certified-chocolate-cocoa-farmers-continue-live-extreme-poverty

From Cradle to Grave

The number of children working in child labour in cocoa production in West Africa use to be around 2.12 million. Sources reveal that out of this, 2.03 million children were found in dangerous work conditions in cocoa production in Ghana and Côte d'Ivoire in 2013/2014. This is an increase of 18 percent compared to 2008/2009. What are these figures today? Make Chocolate Fair! calls on chocolate companies to intensify their activities in fighting child labour and demands higher prices for the cocoa farmer's product.
https://makechocolatefair.org/news/tulane-report-child-labor-rise-west-africa

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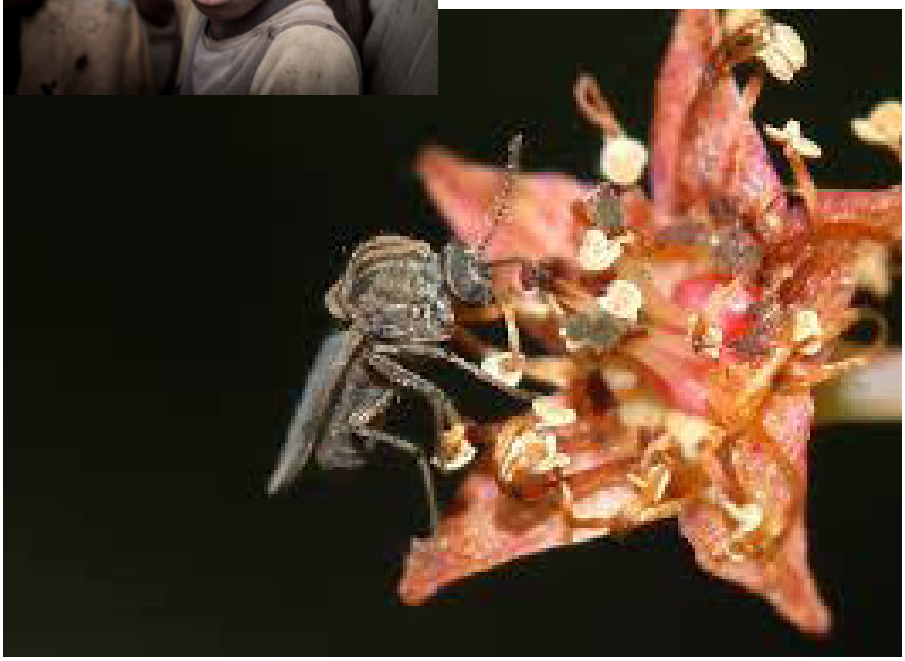


RECIPES:

Chocolate Chai Kefir Smoothie

5 minutes · Serves 1

Blend together the following ingredients. Adjust quanitities of ingredients to your own taste preference:

1/2 tsp Chai spice blend
2 tbsp Cocoa powder (more refined)/ or
Cacao powder (less refined & healthier)
2 pinches Pink Himalayan salt
1 tsp Vanilla
pure Stevia liquid extract
1 cup Kefir (for one serving)

Source:
https://www.ohsweetmercy.com/chocolate-chai-kefir-low-no-or-all-the-fat-your-choice/

WRITTEN BY : Nicolette Da Costa

Nicolette completed her tertiary education in social sciences, humanities and romance languages through the University of the Witwatersrand (WITS) and UNISA.Subsequently, her drive for making a difference lead her to the complementary health world where she is a registered Therapeutic Reflexologist & Meridian Therapist. Over the past 16 years, Nicolette has run her practice in Johannesburg providing treatments that offer strong support in bringing about stress relief, healing and recovery from illness, and a sense of greater vitality for people of all ages, from all walks of life. She has written several magazine articles and an e-book called *Earthing The Wired Generation -Stress Relief for Busy Kids*, available on Amazon.com. She believes that 'wellbeing', in all senses of the word, individually, societally, and globally, now and for the future, is inextricably tied in with nature. We can not fully care for ourselves & one another without looking after and being with the natural world.

Magical Transformation – beetles and lizards

Bushveld lizards are commonly found on open sandy flats interspersed with trees, shrubs and grasses.

Mimicry – the ability of one organism to imitate another, usually poisonous or venomous species, for their own protection is widespread across nature. Some harmless snakes resemble highly venomous ones, certain inoffensive insects resemble wasps and hornets which sting and many moths have large eyelets on their wings to look like an owl or cat.

In the savanna biome of southern Africa, including the Kalahari, Central Bushveld, Mopane and Lowveld regions, their lives an interesting lizard called the Bushveld Lizard *Heliobolus lugubris.* It is a medium-sized lizard measuring around 120 mm total length when adults and has closely related species further north in East, West and North Africa.

What is remarkable about this species is its colour transformation from hatchling to adult. Female lizards lay 4-6 small oval eggs inside chambers dug in loose soil or sand and these hatch from December through to March. During the late summer season hatchlings can be extremely abundant in suitable habitat.

Their colouration is striking, being jet black with a series of yellow spots across the back and usually a yellow stripe on the tail. There is a good reason for this unusual colour – it serves as an aposematic or warning colour, however, unlike other animals which exhibit aposematic colours… which are usually venomous, the bushveld lizard is harmless. However, it resembles several ground beetles in the family Carabidae which can squirt acids or quinones and are extremely distasteful to predators. This is particularly true for species like the Two-spotted Ground Beetle *Thermophilum homoplatum* and Yellow-spotted Ground Beetle *Craspedophorus bonvouloiri* and associated relatives such as *Anthia* ground beetles. These beetles move rapidly in a stop and go, jerky fashion, which the young lizards imitate. As a result, a potential predator perched above in a tree will think twice

Adult lizards rely more on speed and cryptic colouration to avoid predation.

Hatchling colouration is striking, being jet black with a series of yellow spots across the back and usually a yellow stripe on the tail.

about snatching up one of these lizards to avoid a mouthful of bitter disappointment.

As the lizard matures the back colour transforms to a sandy brown and the yellow spots disappear altogether. At this stage, the adult lizards rely more on speed and cryptic colouration to avoid predation.

Bushveld lizards are commonly found on open sandy flats interspersed with trees, shrubs and grasses. They tend to avoid heavily vegetated areas. They emerge from burrows, or, from under rocks and logs in the morning, as soon as the sun starts heating up the substrate, and remain active throughout most of the day, running between sun and shade whilst searching for food.

Prey includes termites and ants, as well as small spiders, beetles and grasshoppers. Activity decreases drastically during the cooler and dry winter months and will remain hidden from around May to August. Longevity is unknown in the wild and probably live between 3-5 years.

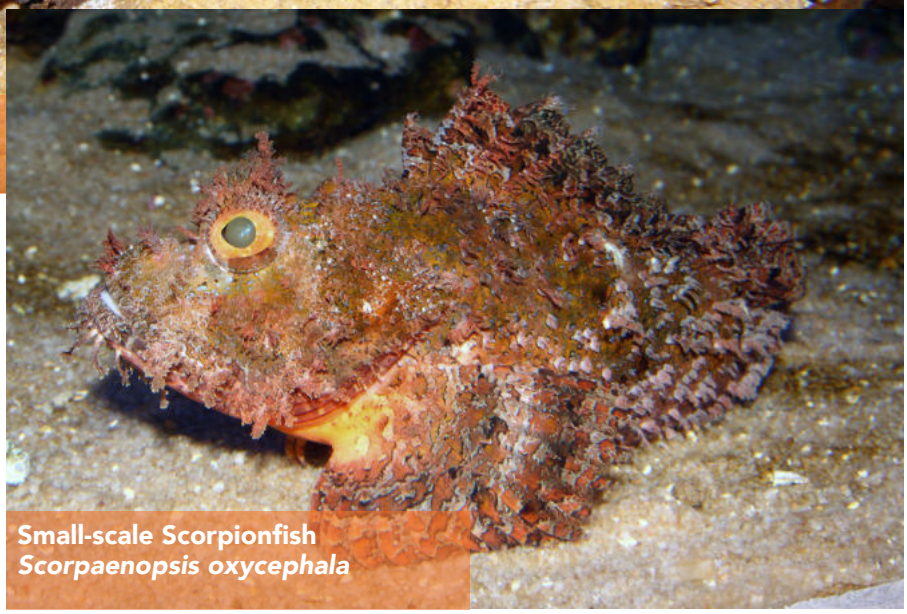
A ground beetle similar to the ones with yellow spots to which the hatchling Bushveld Lizard mimics.

Hatchling coluration resembles several ground beetles in the family *Carabidae* which can squirt acids or quinones and are extremely distasteful to predators, especially *Anthia* beetles.

Text and photos: Warren Schmidt

Blending in...

Stonefish *Synanceia verrucosa*



Small-scale Scorpionfish *Scorpaenopsis oxycephala*

Many animals are masters of crypsis or camouflage, but some take it to the extreme. Along Africa's coastline are a number of fish that reign supreme in the invisibility category. Many examples can be found, such as flounders and soles on sandy substrates, blennies and klipfishes in rock pools, and of course, the master ambush predators – the stone and scorpion fish.

The scorpion and stonefishes fall in the family Scorpaenidae, in reference to the arachnid scorpions which can deliver a painful, and sometimes lethal, sting. There are over 330 species found in this family and distributed throughout most tropical and sub-tropical seas, especially in the vicinity of reefs.

Many species have dorsal, pectoral or anal spines which are hollow and connected to venom glands within the body, some species containing particularly toxic venom. When pressure is exerted on these spines, such as when handled or stood upon, these spines act like hypodermic needles and inject venom into the victim. Wounds are excruciatingly painful and some injuries can prove fatal if immediate and effective treatment is not given. Remarkably, submersion into very hot water is known to break down the toxic proteins.

The small-scale scorpionfish *Scorpaenopsis oxycephala* is found along the East Coast of Africa where it frequents coral reefs to a depth of around 35 metres. They lie motionless against the backdrop of coral and rock and ambush small passing fish that swim nearby.

The Stonefish *Synanceia verrucosa* is found over much of the Indian Ocean and Pacific but in close association with shorelines. It lives in shallow coral and rocky reefs. They are ambush predators feeding on fish sometimes up to half their own size. Due to their impressive camouflage and toxic spines, they have few natural enemies. This species can attain a length of 400 mm.

Text and photos: Warren Schmidt

Spotted Thick-knees

Their mottled colouration renders them almost invisible.

For many decades we knew of this bird as the "Dikkop", but today they are referred to as Thick-knees, in reference to their swollen tibia-tarsal joints. This name is misleading however, as the tibia-tarsal region is the bird's ankle and not its knee! Thick-knees are common, largely nocturnal birds found across most of southern Africa and equally at home in fynbos, grassland and savanna. They avoid tropical forest along the eastern coastal seaboard.

Largely nocturnal, when most activity and calling takes place, but are frequently seen standing perfectly still under cover during the day. They choose backgrounds such as dry stony ground, or fallen leaves, or dry veld grass and sand, where their mottled colouration renders them almost invisible. When threatened, or protecting a nest, Spotted Thick-knees will splay out their wings revealing a white and black-striped pattern. This sudden contrast and display seems to divert wandering animals like cattle, elephants and antelope, away from the nest.

Thick-knees have long, stilt-like yellow legs together with yellow eyes. The bill is black but yellow at the base. The feathers on the face have white patches and the body feathers are brown interspersed with white and covered with a regular pattern of black blotches. This colour affords exceptional camouflage in some environments, especially fynbos. The loud whistling cackle is heard at night when these birds venture into the open in search of their food. When approached they take flight but usually only over a short distance before settling to ground again, where their long legs aid in rapid running motion.

The Spotted Thick-knee feeds on a wide variety of invertebrate prey, including beetles, termites, grasshoppers, crickets, worms, spiders, scorpions and solifugids. They will also take frogs and small reptiles. They actively forage for their prey on open ground. These birds have exceptionally keen eyesight, even at night.

Females lay eggs in a shallow scrape above ground, either in the open or underneath a shrub or bush which affords the nest greater protection. 1-3 eggs are laid which take 24 to 30 days to hatch. Chicks are fed by both adults.

Class: Aves
Order: Charadriiformes
Family: Burhinidae
Species: *Burhinus capensis*
Etymology: *Burhinus* = derived from Latin meaning large or great nose. *capensis* = of/from the Cape region.
IUCN Conservation Status: Least Concern

Thick-knees are common, largely nocturnal birds.

A Spotted Thick-knee at Cape Point Nature Reserve.

ABOUT US.

Biodiversity & Environment Africa is a fully digital, website-based platform - freely available to readers globally. Publications and resources are available as downloadable PDFs, as well as regular online blog posts. It is our hope to make information available as far and wide as possible. In keeping with its environmental ethos, printing and distribution is effectively reduced, therefore striving towards a low carbon footprint and minimal use of natural resources.

The primary objective of B & E Africa is to interpret and disseminate often complex academic research and environmental policies in a digestible and easy to understand format. The website, www.biodiversitynature.com and blog articles therein, can easily be viewed in alternative languages by right clicking and using Google translate.

Never has environmental communications been as important and pertinent as it is in today's rapidly changing, dynamic world. It is critical that people receive reliable information about biodiversity, conservation, and environmental issues. Just as important, communities need to understand why biodiversity is important in their daily lives and why environmental issues are personally relevant to their health and wellbeing. Given the levels of poverty across Africa, the challenges may seem insurmountable, but can be overcome strategically with foresight, dedication and consistency.

Traditional knowledge and consumption of natural resources must be integrated into sustainable biodiversity management strategies and communities need to see, and experience first-hand, the benefits of biodiversity. The benefits of ecosystem services need to be demonstrated clearly and practically. Africa must also be cautious of international and corporate investments which lead to environmental destruction and biodiversity loss for short-term profit. Such short-term financial gain and profits cannot be allowed to overrun long-term sustainable goals and biodiversity conservation objectives. As humans, we yield immense power over the natural world, but we have a moral and ethical responsibility to leave a legacy of natural wonder to the generations that follow, so that they too can experience the majestic roar of lions, the trumpeting of elephants, and the humble dung beetle in the African savanna.

It may seem idealistic to aim for environmental sustainability and conservation of biodiversity when many regions of Africa are suffering from prolonged civil conflict, disease and poverty, but these challenges can be overcome. It will however take dedication and resolve from politicians, and more importantly, Africa's citizens. Thousands of game guards, wardens and environmental activists have lost their lives protecting biodiversity and natural assets across Africa. This alone goes to show that the will to protect is there. We owe it to these fallen heroes to ensure that their sacrifice will not be in vain.

Africa is custodian to some of the world's most unique landscapes, plants, and animals. Elephant, rhino, gorillas and a plethora of less enigmatic but no less interesting creatures call this continent home. Nurturing an appreciation and spiritual connection to these plants, animals and landscapes is critical to ensuring their long-term survival. It is the continent's youth that needs to be uplifted and guided to do this. Environmental education and resource management are essential skills that should be taught at every stage of a child's education, from pre-school to tertiary level. B & E Africa strives to be a communications channel bridging the gap between academic research findings and translating scientific literature into a format that anyone can appreciate and understand.

B & E Africa will cover a range of topics and carry out interviews with scientists, researchers, businesses, and politicians across the African continent and further afield. Some of the topics covered include:

- Biodiversity (focus on diversity and conservation of plants and animals)
- Biosecurity (the prevention of pathogens and invasive species)
- Climate change (global climate change)
- Community upliftment (environmental benefits to communities, tourism, bioprospecting)
- Conservation (endangered species, trade, poaching and conservation issues)
- Economy (financial economics and the environment)
- Ecotourism (safari and game lodges, ecotherapy, tourism, birding and hunting)
- Environmental management (landscaping, environmental scoping and impact assessments)
- Invasive species (spotlight on invasive animals and plants)
- Legislation (environmental law and legislation)
- Marine resources (fisheries and recreation)
- Recycling (waste management)
- Resource management (agriculture, forestry and mining)
- Sustainability (development and resource management)
- Technology (GIS, satellites and other technology used in environmental management)
- Water (water resource management & wetlands)

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