Sustaining Nature's Diversity

Issue 6, August 2021

BIODIVERSITY & ENVIRONMENT AFRICA

SPECIAL ISSUE

LOWVELD BIRDING

HEALTH & WELLBEING

SLOW FOOD
13 benefits of fermentation

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Cover image: Cape Glossy Starling

Photo: Warren Schmidt

MISSION

Biodiversity & Environment Africa (publication) strives to present accurate and informative news on biodiversity and environmental issues 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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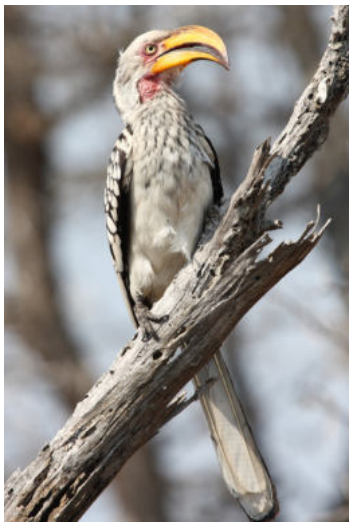


Frenetically at Ease

As I write this piece in the early hours before dawn, my mind is racing. Ideas and thoughts are bouncing around like a ping-pong ball being smacked frenetically around the table. The month of July in South Africa has been a trying period for South Africa's democracy. The jailing of former President, Jacob Zuma, initiated protest action which quickly spiralled out of control and caught the authorities off-guard. KwaZulu-Natal and parts of Gauteng exploded into chaos, violence and looting. In addition, the SARS Covid-19 virus hit its crest of the third wave, with health facilities pushed to their limits and prompting another level four lockdown, restricting travel between provinces and further stifling economic recovery. Yet again, many staff in hospitality and restaurants were forced to take unpaid leave.

Yet, despite the chaos, the world continued spinning on its axis around the sun. I've often marvelled at the extreme paradoxes we observe daily. Whilst chaos engulfed South Africa, entrepreneur Richard Branson was marvelling at the splendour of Earth as he embarked on his space adventure with Virgin Galactic, steering the way forward for space tourism. According to an article published in the New York Times, booking a seat on one of these space trips will set you back around US$250 000. And of course, Virgin Galactic is not the only company offering future space tourism. Elon Musk's Space-X is also firmly in the market, and Jeff Bezos was another billionaire who casually popped into space in July.

Against this backdrop, I read of numerous workers in London who are sleeping on the street because they can't afford to pay rent. These are people who wake up each day and go into the office or construction site and work a full eight-hour shift, yet have no option but to sleep on a makeshift cardboard mattress exposed to the elements. Sometimes you can't help but wonder if you are living in a world of sheer madness. The disparity between the rich and the poor is incredible.

I'm all for technology and innovation, but it seems to come at a great cost to our sense of humanity. As a species we seem to be so focused on the future that we are not living in the present. The net result is millions of struggling and desperate people, economically torn away from nature, desperately trying to maintain a living in the urban jungle. Yet the urbanites are yearning to feel the green grass under their feet and taste an organically grown apple, worms and all.

In previous issues I've alluded to these socio-economic disparities and the potential fallout. In Issue 1 I reviewed the impact of Covid-19 on ecotourism. In Issue 2 I looked at information overload and the challenges of communicating important conservation and environmental issues to a society bombarded by information. Issue 3 dealt with food security and the recent events in KwaZulu-Natal highlighted just how reliant we have become on supermarkets for our daily bread, with unbelievably long queues and limitations on what you could buy. In Issue 4, my viewpoint title was "Global instability is a serious threat to biodiversity conservation". This statement holds equally true for regional instability. Few people would have been thinking about conservation and environmental issues when trying to protect their belongings from hoards of looters! And in Issue 5, we looked at canned lion hunting. To take a break from all these serious worldly issues, and without having the cash to book a seat on the next space odyssey to view our blue planet from afar, sit back and enjoy a scenic birding trip through the lowveld region of South Africa, and be frenetically at ease.

Biodiversity & Environment Africa has also undergone substantial changes during June and July. As a result, we were unable to produce the June and July issues, as time was taken up with the complete revamp of the website. Hopefully these changes will make navigating and reading our online content an even more rewarding and pleasurable experience.

VIEWPOINT WRITTEN BY:
Warren Schmidt

Warren Schmidt holds a Master of Science degree in Ecological Sciences awarded by the University of KwaZulu-Natal, South Africa. He has three decades of experience in ecology, conservation science, invasion biology and herpetology. He has worked as a journalist, magazine editor, and lecturer, and has presented talks, seminars, and lectures.

Birding through the Lowveld

The lowveld is a landscape of subtle extremes as you navigate through river valleys and up steep hillsides. It is an area of rich and varied plant life invigorated by a sub-tropical climate. The lowveld, as the name suggests, is the large swathe of land found east of the escarpment and includes the majestic Kruger National Park. It stretches out onto the endless Mozambique plain and curves around the Lebombo Mountains into the northern parts of KwaZulu-Natal. It was the playground of Jock of the Bushveld and many writers have written about epic adventures and interactions with wildlife. The contrasting landscapes have provided inspiration for many artists who have encapsulated the views to canvas – from silhouetted acacia sunsets to rocky outcrops.

The Kruger National Park and many of the surrounding game reserves and lodges attract millions of visitors annually, with many wanting to catch site of the famous "Big 5". The wetlands, forests and savannas are also a wonderland for avid birders, where one could tick off over 200 species on a good day. In this feature article we take you up close to some of this region's amazing birds.

Text and photos by Warren Schmidt

Fork-tailed Drongo *Dicrurus adsimilis*.

Egrets, herons and storks

A group of usually large unmistakable birds with long stilt-like legs and often associated with wetlands. Many species feed on invertebrates and small vertebrates with some specialising in amphibians and fish. Others are granivores.
As dusk engulfs the light, flocks of Cattle Egrets settle in for the night in shrubs around reedbeds. These flocks can consist of dozens of individuals.

During the day they forage alongside grazing mammals, catching insects and frogs flushed from the disturbed vegetation. Herons are superb predators with spear-like bills used to catch fish, tadpoles, and aquatic insects around water.

The Green-backed Heron can remain motionless for long periods and then rapidly strike out at unwary prey. Herons construct large flat nests made from sticks and reeds and often placed above water or up in trees. The Saddle-billed Stork with its bizarre red and black bill is a sight to remember as it moves along shallow rivers.

Cattle Egrets *Bubulcus ibis*.

Cattle Egrets *Bubulcus ibis*.

Cattle Egrets *Bubulcus ibis* settling in at their roost site for the night.

A Grey Heron *Ardea cinerea* on her nest.

A Green-backed Heron *Butorides striata* patiently hunting at the water's edge.

The majestic Saddle-billed Stork *Ephippiorhynchus senegalensis* at a lowveld river.

Ducks and Geese

Waterways attract around 10-14 different species of duck and geese. One of the most prevalent are the White-faced Ducks which congregate around feeding spots in large flocks. Male and female white-faced ducks look identical but there is marked sexual dimorphism in the other species. Yellow-billed and African Black Ducks are less common but still often seen around ponds, dams, and quieter backwaters. Egyptian and Spur-winged Geese are also commonly found in the lowveld. Ducks and geese are superbly adapted to floating along water and ducking down to grab aquatic plants and the occasional invertebrate.

White-faced Ducks *Dendrocygna viduata*.

Raptors

The lowveld is a bird-of-prey stronghold that attracts many raptor enthusiasts from around the world. The vultures are a well-known and often despised group, but they form an important ecological role in the lowveld system. Unfortunately, vulture numbers are decreasing due to poisoning and accidental collisions with infrastructure such as powerlines. The big eagles are also taking strain with the conservation status of several species being elevated into a higher threat category. The Secretary Bird, Martial Eagle and Bateleur were all recently up-listed to globally Endangered *(see Biodiversity & Environment Africa Issue 1, January 2021).*

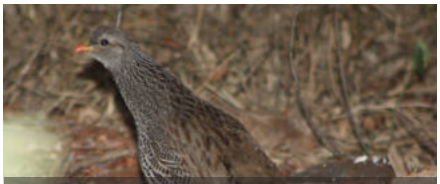
Another famous raptor is the iconic African Fish Eagle with its characteristic call as it flies over waterbodies. These birds are excellent at catching fish by swooping down and grabbing them in their sharp talons. Brown and Black-chested Snake Eagles have excellent eyesight, as do most raptors, and keep a sharp eye out for any snake or lizard scuttling through the undergrowth. The smaller Sparrow-hawks and Kites are just as efficient in capturing small rodents, birds and insects. Raptors are characterised by their sharp bills used for piercing and tearing apart prey as well as the sharp talons used to catch, impale, and hold their prey.

Wahlberg's Eagle *Aquila wahlbergi* is a small and slender eagle.

Bateleur *Terathopius ecaudatus* are impressive lowveld raptors but sadly their numbers are declining.

Game birds

The Helmeted Guineafowl is one of the most commonly seen birds in the savanna. They often gather around roadside verges where they feed on insects and seeds. The Spurfowls and Francolins are closely related and can be mistaken for the sandgrouse. The Natal Spurfowl is another terrestrial bird often seen next to the road. These birds are cryptically coloured and easily overlooked when they remain motionless. Spurfowls have double spurs on the legs of male birds which sets them apart from the francolins. These spurs are used in territorial fights and may assist during mating by latching onto the female.



Natal Spurfowls *Pternistes natalensis* are commonly seen foraging alongside roads.

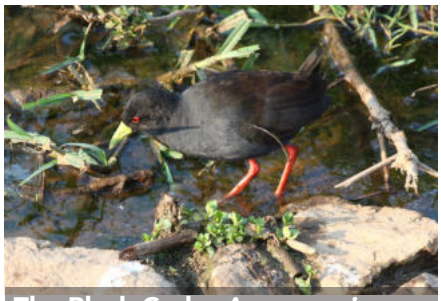
The Helmeted Guineafowl *Numida meleagris* is a very common bird of the savanna.

The characteristic casque of the Helmeted Guineafowl.

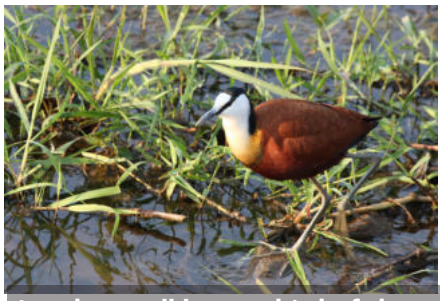
The wetlands

Many dams and rivers in the lowveld are seasonal and dry up over winter, but the summer rains fill depressions creating numerous pans. Flooding is common, and at certain times dams and rivers overflow their banks. The wetlands attract thousands of birds where they forage and nest. An entire magazine could be devoted just to wetland birds. The Black Crake

scuttles effortlessly between reeds and over floating vegetation. Nearby, the African Jacana with its rufous brown plumage, white neck and exaggerated toes, runs effortlessly over floating weeds. On more open sand and mud banks, Three-banded Plovers are often seen running up and down after small invertebrates.



The Black Crake *Amaurornis flavirostra* actively scurries over floating vegetation.



Another well-known bird of the wetlands – the African Jacana *Actophilornis africanus*.

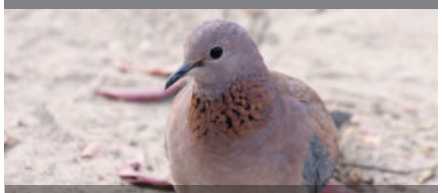
Doves, pigeons and sandgrouse

Doves and pigeons are known to most people because of their strong association with urban environments. In the savanna there are other species not often seen in the central urban areas. One such species is the African Mourning Dove with its orange-rimmed eyes. These doves are frequently seen perched in riverine forest around campsites in the Kruger National Park. The

Related to pigeons and doves, the Double-banded Sandgrouse *Pterocles* is the only sandgrouse of the lowveld.

Emerald-spotted Wood Dove is another savanna dove with iridescent wing coverts. Perhaps the most attractive savanna species is the lemon-green African Green-Pigeon with its contrasting bright yellow legs and red feet. Sandgrouse are a species of the central arid regions but one species, the Double-banded Sandgrouse is found in the lowveld and easily mistaken for a francolin or spurfowl.

A pair of African Mourning Doves *Streptopelia decipiens*.



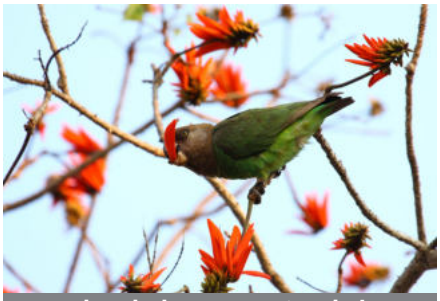
Laughing Dove *Streptopelia senegalensis*.

Parrots and louries

The Brown-headed Parrot is found throughout the lowveld, but a second species, the grey-headed parrot, occurs in the far northern regions, being associated with mopane savanna. Brown-headed Parrots are frugivores feeding on a wide range of seeds, nuts, fruits and flowers. They use their dexterous

Brown-headed Parrot.

feet to manipulate food items to their bill. They have powerful beaks which can open hard encased seeds and strip fruit. They are partial to flowers like the red blossoms of the flaming coral tree. Parrots nest inside hollow tree cavities. Attracted to rest camps, the all-grey Go-away Bird (or Grey Loerie), is a common resident and like the parrots, it is a frugivore feeding on various seeds and fruits.



Brown-headed Parrot *Poicephalus cryptoxanthus* feeding on the flowers of a coral tree.

Grey Go-away birds *Corythaixoides concolor* are commonly seen around rest camps and picnic spots where they become very tame.

Owls and nightjars

Evening time in the savanna is a magical time when a range of nocturnal and secretive animals emerge. These include the leopard, hyenas, jackal, civets and genets. Many birds return to their favoured roosts, but this is the time when the owls and nightjars take flight. During the day, nightjars are a superb example of cryptic camouflage, blending invisibly against their background. At night they hunt and are often seen absorbing heat from the road surface. Their nocturnal calls are one of the bushveld's distinctive calls. Around 10 species of owl can be found in the lowveld, from the large Verreaux's Eagle-Owl to the diminutive African Barred and Pearl-spotted Owlets. Owls are nocturnal predators feeding on invertebrates, rodents, and in the case of the Pel's Fishing Owl, taking fish and frogs. Owl pellets (regurgitated fur and bone fragments) are often seen around favourite trees or buildings.

A Pearl-spotted Owlet *Glaucidium perlatum*.

Hornbills

A trip to the lowveld would not be complete without seeing the hornbills. The most sought-after is the massive Southern Ground Hornbill. It is a large black bird with a fleshy red face and crop. Their clumsy marching gait can be deceiving though, as these birds are voracious predators. Snakes, lizards, tortoises, small birds, and rodents are not safe when these birds patrol along the ground. Ground hornbills have been observed with several prey items hanging from their beaks.

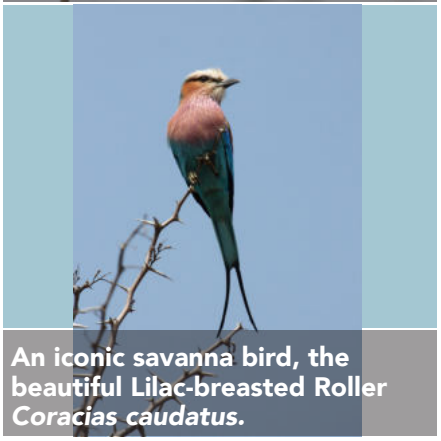
Yellow- and Red-billed Hornbills are a common sight around campsites where they can become very tame. They forage in trees, shrubs and on the ground. Hornbills are omnivorous, feeding on fruits and various invertebrates.

Kingfishers, bee-eaters and rollers

The lowveld is home to some spectacularly colourful birds of which the rollers and kingfishers stand out. The Lilac-breasted Roller is an efficient aerial predator catching insects in flight and sometimes small lizards on the ground. The brilliant blue is notable during flight. Several other rollers are found in the region, some like the European and Broad-billed Rollers are seasonal migrants. The Bee-eaters are another colourful group which feed on bees and wasps. They construct their nest sites into the side of earth banks. The rivers and wetlands attract a diversity of kingfishers, including the Giant Kingfisher and the black and white Pied Kingfisher. The smaller kingfishers have brightly contrasting colours of bright blue and purple. As the common name suggests, these birds catch and feed on fish of various sizes and the Giant Kingfisher can take exceptionally large prey. The Brown-hooded Kingfisher is a generalist, feeding on insects, frogs, and lizards.

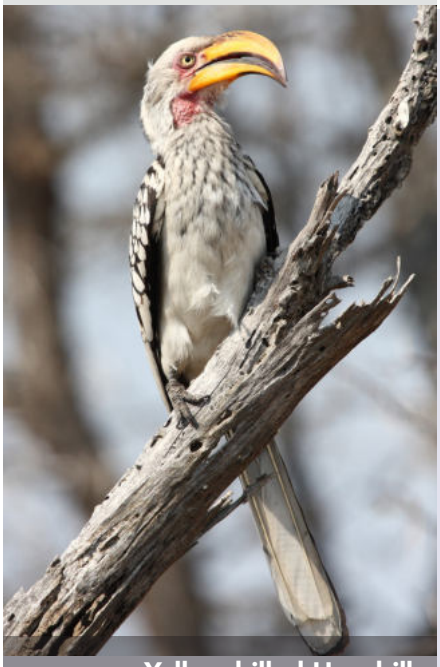
This Giant Kingfisher *Megacerle maximus* has just caught its prey from a lowveld river.

The black and white Pied Kingfisher *Ceryle rudis*.



An iconic savanna bird, the beautiful Lilac-breasted Roller *Coracias caudatus*.

Red-billed Hornbill *Tockus erythrorhynchus*.



Yellow-billed Hornbill *Tockus leucomelas*.

Drongos, Orioles and others

The lowveld trees and riverine bush create a paradise for hundreds of smaller birds. Many often go unnoticed as they scurry inside thick vegetation which affords them protection. Others forage along the ground raking leaves and debris aside to get at small invertebrates, including spiders and grubs. The Chin-spotted Batis is a small, attractive bird which often calls from the branches of shrubs and flutters between thickets. The Fork-tailed Drongo perches on exposed branches and keeps a watchful eye out for insect prey, either hawking insects when in flight or pouncing on prey on the ground. Black-headed Orioles are often seen around flowers, especially aloes during winter.

Some of the other common lowveld residents include the Dark-capped Bulbul, Southern Black Tits and the similar-looking Southern Black Flycatchers. Wagtails are distinctive around lawns and gardens and the African Pied Wagtail is often found in the vicinity of rivers and streams.

The thrushes are numerous and have a strong preference for riverine forests and thick bush clumps where they scavenge through leaf-litter for invertebrates. The Kurrichane Thrush and Groundscraper Thrush are two common species in the lowveld.

Dark-capped *Bulbul Pycnonotus tricolor.*

The Kurrichane Thrush *Turdus libonyanus* is often observed foraging through fallen leaf litter for invertebrate prey.

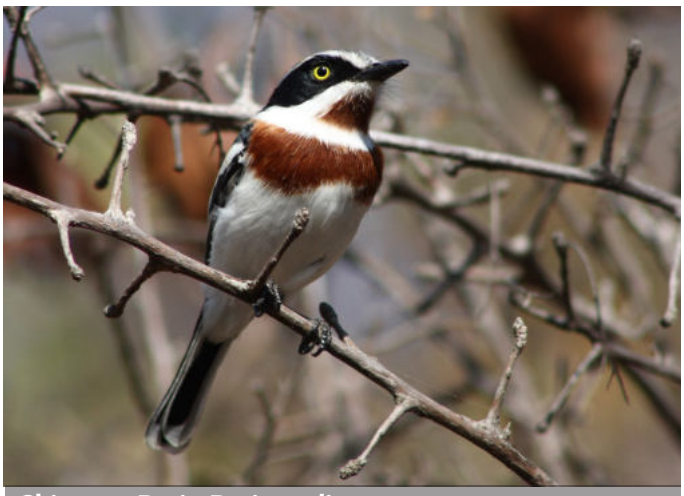
Southern Black Flycatcher *Melaenornis pammelaina.*

Southern Black Flycatcher.

African Pied Wagtail *Motacilla aguimp.*

Southern Black Tit *Parus niger.*

Black-headed Oriole *Oriolus larvatus.*



Chinspot Batis *Batis molitor.*

The starlings

The lowveld region has at least eight different starlings. In the hills leading to the escarpment, Red-winged Starlings are found, and the Violet-backed Starlings are seasonal migrants visiting the lowveld in summer.

The blue glossy starlings are the ones that can easily confuse visitors to this region as they all look very similar. Identification is also affected by lighting as different iridescent shades highlight under shade, cloud, or sun.

Meve's Starling is found more in the northern parts and has a characteristic long tail. Burchell's Starling is one of the

Greater Blue-eared Starling *Lamprotornis chalybaeus*.

Greater Blue-eared Starling

Cape Glossy Starling *Lamprotornis nitens*.

Burchell's Starling *Lamprotornis australis* is the largest of the glossy starlings.

larger species and also has a relatively long tail. The greenish blue and dark facial line running through the eye differentiate the Greater Blue-eared Starling from the Cape Glossy Starling which tends to have a more bluish gloss. The glossy starlings are often attracted to rest camps and picnic spots and are therefore easy to observe. Wherever big game roam, the Red and Yellow-billed Oxpeckers will occur. They have feet suitably adapted to clinging on the sides of giraffe, zebra, and antelope where they feed on external parasites, loose skin, and other flaking bits. They can be a nuisance to wounded animals as they peck at the exposed flesh.

Cape Glossy Starling

A Red-billed Oxpecker *Buphagus erythrorhynchus* on the side of an impala.

Red-billed Oxpecker.

Sunbirds

The sunbirds are a group of small dainty birds with scimitar shaped bills used to extract nectar from flowers. They are important pollinators of many plants.

A Scarlet-chested Sunbird *Chalcomitra senegalensis* at her nest.

Brown-headed Parrot *Poicephalus cryptoxanthus* feeding on the flowers of a coral tree.

Slow Food

13 health benefits of fermented foods

Fermentation enhances certain foods both in terms of taste, preservation, and nutrient density. Fermented foods offer a plethora of distinct textures, flavours, and aromas, and have been part of everyday life since the early ancestors of various traditional cultures. This age-old process is achieved through controlled microbial and enzymatic activity. In this final article on fermented foods, we explore an interesting range of culinary crafts which remind one of slower days. The necessary time is taken along gradual stages where friendly microorganisms, yeasts, and bacteria create the chemical breakdown of nutrients, emitting heat and leading to effervescence.

Fermentation carries a range of health-giving benefits as a result of containing vitally important nutritional elements such as digestive enzymes, omega-3 fatty acids, probiotics, and vitamin B.

Across various categories –from pickled vegetables to health drinks and dairy products –fermented foods have re-emerged as a popular comeback from older times.

Life Before Fridges

"Historically, food was fermented as a means of preservation. Unique compounds produced during fermentation, such as antimicrobial peptides and lactic acid, inhibit the growth of pathogenic microorganisms and prevent food from spoiling. However, humans quickly realized that fermentation also had benefits beyond preservation. It could improve the tastes and textures of food and made it burst with nutrient density.

Integrative and functional medicine practitioner, Dr Chris Kresser, takes us right back through anthropological research around the earliest consumption of fermented foods. Gene-mapping studies show

1. Fermented foods support your friendly gut bacteria known as the microbiome -and also:
2. Enhance digestive function and bowel regularity
3. Fight against pathogens more effectively thanks to their anti-microbial properties, which aids our immune system
4. Boost the nutritional value of foods
5. Are 'happy mood' foods
6. Support memory, concentration, & help clear brain fog
7. Help to improve bone health
8. Promote cardio-metabolic health
9. Help regulate blood sugar and help improve weight management
10. Boost immunity and reduce inflammation
11. Regulate cell growth
12. Keep your skin healthy from within
13. Protect against damaging effects of toxins.


Kimchi


Sauerkraut

>>>>>>>>>>> *continue to page 18*

Beneficial bacteria (lactobacillus) living in the honey stomach of a bee are added to the nectar, as is the enzyme invertase via the bees salivary glands. Due to honey's high sugar content, it is easily fermented into alcoholic 'honey-wine', otherwise known as mead.

that the first hominids developed specialised cell receptors designed to interact with metabolites produced by lactic acid bacteria that was found abundantly in fermented food.

Traditional Cultures

Just about every culture throughout the world heralds a selection of fermented foods. The earliest intentionally fermented drink seems to date back to 7000BC China, made up of rice, honey, and fruit. With the arrival of agriculture, people began to ferment a variety of foods, from grains to fish and meat, such as salami. "Bulgaria is often credited with introducing yogurt to the world; ancient nomadic people in the region stored raw milk in animal skins, where it underwent fermentation. The Japanese are famous for miso fermented bean curd, and natto, a pungent fermented soybean dish. The Koreans have kimchi, and Icelanders have hárkarl, a fermented shark dish", describes Dr Kesser.

Most Loved Foods

Kimchi & Sauerkraut
Sauerkraut is a fermented cabbage dish that originated in the 4th century BC in northern China and may have been introduced to Europe by the Mongols. Sauerkraut can be made with a starter culture or it can be wild-fermented, which means using the naturally occurring yeast on the vegetables to activate fermentation. Kesser identifies the amazing micro-biodiversity of good bacteria arised herein: "When made with a starter culture, sauerkraut tends to be high in Leuconostoc, Lactobacillus, and Pediococcus organisms. In contrast, wild-fermented sauerkraut is more variable in composition, containing substantial amounts of Enterobacter and Pseudomonas."

Similar to Sauerkraut is a dish called Kimchi, which is a word used to describe a variety of salted and fermented vegetables that originate from Korea. Kimchi is typically made up of cabbage, radishes, chili, pepper, garlic, onion, ginger, and salt. It sometimes also includes additional ingredients such as sesame seeds, apple, and pear. Kimchi is colonised by lactic acid-producing Leuconostoc bacteria.

Sourdough Bread
Not all bread has a bad rep. Up until the take over of commercially manufactured breads founded on industrial yeast and quick-rising agents which came to monopolise our food supply chains, our great grandparents made their own home-made sourdough based soundly upon the old methods of fermentation. Unfortunately, the transition away from traditional fermented sourdough bread to quick-rise bread made with instant yeast left us with processed bread, to many, still part of their staple diet, bringing into effect digestive problems and providing such little nutrients that bread today is fortified and misleadingly labelled as nutritious and full of fibre.
Sourdough bread production begins with the creation of a sourdough starter, which is a combination of flour and water mixed together and left open on the counter for several days. Yeast and lactic acid bacteria in the air colonise the starter, kick-starting the fermentation process. While sourdough does not contain active probiotic cultures, it has other health benefits brought about by fermentation, including a lower glycemic index than quick-rise bread made with commercial yeast. Consuming carbohydrates that have a lower glycemic index is beneficial for weight management and for preventing insulin resistance and diabetes.

Kefir & Yoghurt
Quite similar to traditional Greek or Bulgarian yoghurt, or African sour milk known as amazi, Kefir is slightly effervescent and sour and is fermented with kefir "grains," a live culture made up of proteins, lipids, sugars, bacteria, and yeast. The bacteria and yeast feed off the nutrients in the "grains," creating a symbiotic microbial culture. Kefir can be made from cow, goat, or sheep milk. It contains yeasts such as Kluyveromyces lactis and Saccharomyces cerevisiae and a variety of Lactobacillus species, including Lactobacillus kefiri.

For more on Kefir, download our April issue.

>>>>>>>>>>> *continue to page 15*

Cheese
Cheese is a fermented milk product produced through the coagulation of the milk protein casein. During cheese production, the milk is acidified by means of microbes such as lactic acid-producing bacteria, and enzymes such as rennet are used to coagulate the milk. Once the dairy solids have separated, they are often pressed into a form and go through an aging process that promotes the growth of various moulds. The origin of the milk, types of bacteria and mould, and the environment in which cheese is processed and aged all come together to influence the aroma, flavour, texture, and colour of the cheese. While probiotic starter cultures are used to start up cheese production, these bacteria often do not survive the long aging process. In some cheeses, such as Gouda and cheddar, only small amounts of probiotic bacteria survive the aging process and are found to be present in the final product.

Historical accounts of cheese making are found throughout Europe before Roman times. Today's industrialized cheeses made with pasteurized milk, commercial starters, and genetically modified enzymes, that most people in the Western world eat today, are a far cry from the exquisite artisan cheeses made with raw milk and traditionally crafted through fermenting and aging processes over extended periods.

Kombucha
Many people have heard about or used raw, un-sifted apple cider vinegar on salads, or taken it with warm water first thing in the morning to detox and help boost digestive health and alkalinity. But kombucha is quite a different fermented product in its own league. Kombucha is a fermented, slightly alcoholic, effervescent beverage made with black or green tea and sugar. The tea and sugar mixtures provide a fermentation medium for a rubbery disk-shaped symbiotic culture of bacteria and yeast, also known as a "SCOBY" or the "mother". (Recall this term "with the mother" when looking at murky bottles of apple cider vinegar?). Kesser explains how the "extra-terrestrial-looking SCOBY is actually a biofilm consisting of numerous microbes, including the acetic acid-producing bacterium *Komagataeibacter xylinus* and the yeast, *Zygosaccharomyces bailii*". To enhance flavour, one can add fruit juices and spices to the kombucha. A similar drink called Jun kombucha utilises green tea and honey for SCOBY fermentation. The honey offers additional prebiotic benefits, that feed the friendly bacteria.
Interestingly, kombucha is believed to have originated in China, Russia, or Eastern Europe around 220 BC. While beverages labelled as "kombucha" are widely available in grocery stores today, these processed, sugary drinks are yet again, a far cry from traditional kombucha. SO, be discerning if you want the real thing!

How about Wine?
Natural wine may contain some lactic acid-producing bacteria, such as Pediococcus pentosaceus. Most commercial wines filter out all bacteria, including any residual beneficial bacteria, and are frequently a source of other unsavoury additives.

...and Beer?
Beer is currently the most widely consumed fermented beverage in the world. It is produced by steeping a starch source, such as cereal grains, in water and fermenting the liquid with yeast. Before grains are ready to be fermented into beer, they must be malted. Malting allows the cereal grain to germinate, releasing enzymes that break down the complex carbohydrates in grains into simple sugars. The simple sugars feed the yeast, which results in alcohol. Most beer is fermented with brewer's yeast and hops, the aromatic and bitter flowers of the *Humulus lupulus* plant.

Chocolate
Chocolate is made from the fermented seeds of the Theobroma cacao tree native to the Amazon rainforest. After the cacao pods are harvested, the seed and pulp are allowed to spontaneously ferment. As listed once again by Kesser, the microbes that ferment cocoa include the bacteria *Lactobacillus fermentum* and *Acetobacter pasteurianus* and four yeast species: *S. cerevisiae; Hortaea thailandica; Hanseniaspora opuntiae*; and *Pichia kudriavzevii*. While the drying and roasting of fermented cocoa beans may likely kill off many of these microbes, there are still various bioactive microbial compounds which stay behind, imparting chocolate with much of its cherished flavours and aromas.

For more on chocolate as a fermented food, download our May issue of B & E Africa in PDF format.

When to avoid fermented foods temporarily

Kesser advises that although fermented foods are healthy, nutrient-dense add-ons to most diets, there are however two health situations in which it may be best to avoid fermented foods temporarily: histamine sensitivity or intolerance; and mould illness or chronic inflammatory response syndrome.

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-https://dobbernationloves.com/food-drink/fermented-honey/
https://www.perfectbee.com

Recommended Reading:
Wild Fermentation by Sandor Ellix Katz

Nicolette's background in sociology lead her to the complementary health field where she is a registered Therapeutic Reflexologist & Meridian Therapist. 17 years of being in practice has shown her how natural therapies and sound nutrition can play a definite vital role in supporting the healing process by bringing about balance and harmony. Outside of the therapy room, Nicolette has come to appreciate 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 and one another without living in synergy with the natural world."

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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