

angels in CAMOUFLAGE

An appreciation of larks

Larks have inspired poets as glorious as William Wordsworth, John Milton and Percy Bysshe Shelley, yet most birders consider them only as bothersome LBJs. Much maligned, they are often viewed as little more than a boring identification chore. However, larks have a history as old as Africa itself. Some members have the most remarkable survival techniques in the avian world, and they sing and display like angels. So is there more to these sombre brown birds than first meets the eye? Shelley thought so, and so do I, writes KEITH BARNES.

Larks are a massive identification challenge and, together with pipits and cisticolas, they wear the unwelcome mantle of 'Africa's LBJs'. Most species use open habitats in desert, semi-desert and grasslands, and are characterised by a great deal of morphological convergence. This is because the environments they exploit are very similar, so the species often end up looking confusingly alike. To exacerbate the problem, differences in plumage and form are frequently as great within species as they are between them.

It isn't just the casual birder who has problems distinguishing between larks. Ornithologists have been arguing about them for more than 100 years, with many inconsistent and controversial taxonomic treatments being proposed in the last century. Two of Africa's specialists in lark taxonomy ventured vastly differing opinions on the matter. In his *A Review of the Alaudidae*, perhaps the most flawed taxonomic treatise on the family ever produced, Richard Meinertzhagen flamboyantly stated, 'I make no apology for my methods, for I believe that they correctly interpret the facts and that posterity will concur. My view on the

validity of geographical races is not orthodox. Having been a sinner myself, I can expiate my indiscretions without exultation and in repentance.' Conversely, Gordon Maclean wrote, 'It is doubtful whether the matter [of lark systematics] will ever be satisfactorily resolved.' Maclean's cautious view was in strong contrast to Meinertzhagen's self-assured and somewhat misguided statements. The truth of the matter probably lies somewhere between the two great lark men's perspectives.

The advent of molecular techniques to assess the status of races and species has aided us immeasurably. Good recent work involving genetics has been able to show convincingly that the Long-billed Lark of southern Africa, once regarded as a single, highly variable species, is better treated as five distinct species. And it has revealed, for example, that the rare and highly localised Ethiopian endemic Degodi Lark, only described in 1971, is simply a race of the more widespread Gillett's Lark. These are good instances of just how problematic the taxonomy of this group can be. Without getting too caught up in the mind-numbing world of molecular taxonomy, let's explore what these birds can tell us about Africa and its history.



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ALBERT FRONEMAN

Most birders in southern Africa are familiar with the Spike-heeled Lark. A short-tailed, upright lark found in a wide variety of open-country habitats, its white outer-tail tips, stocky frame and sociable behaviour render it one of the most easily recognisable and identifiable of all larks. In 1965 John Beesley discovered a small population of this species near Mt Meru, Tanzania, some 2 000 kilometres from its closest neighbours. A short paper describing the bird was published and nothing more was really thought of it. There was a theory that the ice ages that dominated 100 000 years ago may have been responsible for the appearance of this population at the 'wrong' end of the continent. In 1997, Tanzanian ornithologists Liz and Neil Baker invited a team to the area to study the bird. Genetic investigation revealed that this tiny population had been separated from other Spike-heeled Larks for far longer than previously appreciated, probably more than two to three million years. It differed morphologically too, having a particularly short tail and smaller bill.

It was clearly a different species and was named Beesley's Lark in honour of

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its finder. As the bird is highly resident and non-dispersing, it is likely that at some stage in the past this population must have had a contiguous distribution with the Spike-heeled Larks in southern Africa. The rumblings of the Rift Valley and rise of Mt Kilimanjaro and Mt Meru some five million years ago seem to have created a bizarre microclimate on the western side of Mt Meru. With rains being pushed in from the Indian Ocean coastline, the dual rainshadows created by these two massive mountains result in a rainfall gradient that shifts from 3 500 millimetres on the wetter, eastern side of Kilimanjaro to about 500 millimetres on the dry western slopes of Meru. It is apparent that a mini-desert has persisted on the western slopes of Meru as the surrounding habitats have become wooded and moist over the past three million years. As the world around it has changed, Beesley's Lark has been trapped within a micro-habitat: its global range extends only some 40–65 square

Above In the course of one of the more elaborate displays in the family, the Rufous-naped Lark leaps, calls and claps its wings.

Opposite Gray's Lark is restricted to gravel plains in the Namib. Although it strongly resembles the Ammomanes larks of North Africa and southern Asia, it is in fact closely related to the Spike-heeled and Long-billed larks of southern Africa.



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KEITH BARNES (2)

kilometres and probably no more than 100 individuals remain. It is literally on the brink of natural extinction.

But many larks have incredibly small ranges and persist in minuscule patches of habitat. The genus *Heteromirafr*, comprising South Africa's Critically Endangered Rudd's Lark, Ethiopia's Sidamo Lark and Somalia's Archer's Lark, is the most obvious group. With ranges scattered widely across the continent, each of these species occupies an exceptionally small global range. Genetic work has revealed that *Heteromirafr* possibly represents an ancient lineage that is slowly being replaced and outcompeted by more dominant larks.

Larks offer us a unique snapshot of Africa's history, as they are an ancient group of birds that can trace some of the continent's early geological events. They are dominant in Africa's rangelands and, of all the bird families adapted to this habitat, they are also the most species-rich group, with the most complex distribution patterns. All of these factors assist researchers' investigations into the poorly studied rangelands.

Of the 96 species of larks in the world, some 78 are found in Africa. They are concentrated in two main areas in particular: the south-west (South Africa, Botswana and Namibia) and the north-east (Ethiopia, Kenya and Somalia), with 26 and 23 species respectively being endemic to these zones. Some theories propose that over many millions of years these two areas were connected (maybe a number of times) by an arid corridor, and that in the process larks dispersed and speciated across this corridor.

Genetic research has turned up some fascinating evidence in this regard. It seems that true desert larks did not disperse via the arid corridor. Instead, they appear to have evolved from neighbouring larks and have undergone radically divergent morphological evolution. A good example from southern Africa is Gray's Lark. For many years it was thought to be closely related to the *Ammomanes* desert larks of North Africa because of their uncanny morphological similarity. However, Gray's Lark's closest relatives are other southern African larks, including the very dissimilar Spike-heeled and Long-billed lark complexes. Unlike true desert larks, semi-desert and grassland larks do seem to have used



The hypothetical arid corridor that may have persisted during the ice ages and at other periods during Africa's history obviously impacted on the evolution of some larks. However, its effect was limited for other groups, which seem to have evolved more in situ.

the arid corridor for dispersal and there are closely related species that occur at opposite ends of it, such as the Foxy Lark in the north and the Fawn-coloured Lark in the south.

While the study of larks is able to reveal intriguing patterns about the evolution of Africa's arid zones, these hardy little birds also have an array of features that enable them to master the dry country.

Feathers are the first. Larks are dull-coloured birds that have conservative plumage coloration and patterns. There is a good reason for this: they require camouflage. In some larks, the colour of their plumage is linked to that of the soil, and their streaking pattern is related to vegetation density. As rangeland specialists, these birds are placed under severe pressure from aerial predators, with falcons, kestrels and sparrowhawks frequently overhead. When a lark is alarmed by a distant threat, it freezes, relying on its cryptic plumage to best effect. Only when a threat is extremely close does the bird flush.

There are two main types of lark camouflage plumage: generalised and specialised. Generalised plumage comprises a mixture of colours with dark streaking or spotting on the feathers. This offers crypsis anywhere and is particularly useful in a wide range of vegetation backgrounds. Because of their varied habitat use, almost all migrant and nomadic larks (for example, the Somali Short-toed Lark) have generalised camouflage.

Specialised camouflage tends to be uniform and involves a very close colour match with the tones of the bird's favoured habitat. An excellent example >

Opposite, top *The Dune Lark has plumage that matches almost exactly the substrate on which it lives in the Namib sand-dune sea. It can survive without freestanding water and derives its water requirements from its food.*

Opposite, middle, left *The Spike-heeled Lark is a species of open grassland and semi-desert in southern Africa. Unusually, it breeds cooperatively and uses aardvark burrows for shelter in hot climates.*

Opposite, middle, right *The Sidamo Lark belongs to Heteromirafr, a genus apparently in ecological retreat, with all its members having minute ranges scattered across Africa.*

Opposite, bottom *Gillett's Lark, a scarce local resident in arid country in north-eastern Africa, is related to the Karoo and Dune larks of southern Africa – a good example of speciation along the arid corridor.*



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is the Dune Lark, which is resident in the open terrain of the Namib sand-dune sea. Despite lacking cover, the Dune Lark can virtually vanish from sight when it is stationary on bare sand. In an experiment, an ornithologist tried to chase an individual lark with specialised plumage onto a nearby substrate that would make it more conspicuous. The bird refused to remain on the adjoining substrate, preferring to take flight and land where its plumage coloration matched the ground.

When larks take flight, their camouflage often breaks down. Many species have red or white patches in the wings or tail that act as signals for communication and, frequently, for display purposes. The white outer-tail feathers, for example, are often more noticeable from below, where a female might be watching, than they are from above, whence a predator may approach.

As a family, larks have arguably the most variable bills of any African passerines. Those species using softer substrates have longer, down-curved bills for digging and tend to be insectivorous. Seed-eating larks have smaller, finch-like bills, and the Thick-billed Lark has a massive, chunky bill more befitting a grosbeak. This immense variability helps larks exploit virtually any food source available in their meagre environments. Even within species, bill proportions can differ extraordinarily; in the Raso Lark they diverge so significantly that the males and females can practically forage as different species. The longer-billed males dig and probe for food while the females use their smaller bills to flip pebbles. The completely different foraging strategies help this Critically Endangered species to exploit more fully the limited resources on its minute, two-square-kilometre Raso Islet home.

Larks can tolerate massive environmental extremes. The Greater Hoopoe Lark can exist in an environment that receives less than 50 millimetres of rain a year and reaches temperatures of more than 50 °C in summer. Conversely, the Horned Lark survives in the Atlas Mountains, where temperatures plummet below -15 °C on mid-winter nights.

Desert-dwelling larks have developed several impressive physiological adaptations that enable them to survive in parched lands. Individual larks are able

to use less energy during summer by lowering their metabolic rate by up to 30 per cent. At this time of year their food demands are lower and they reduce the size of their internal organs (including liver and kidneys) to suppress their energy requirements. As there is virtually no free-standing water in the deserts where some of these species live, how do they survive? These larks lose water through evaporation at a rate much lower than that expected from similar-sized birds in other families. They are also capable of reabsorbing a considerable amount of water in the intestine when water is scarce. Several species are so efficient at retaining water that they have never been observed drinking. It is thought that some species gain all their water requirements through their food, by eating moist insects or the fleshy parts of plants, or through the oxidation of seeds. In extreme desert conditions, the birds actively seek out items that would improve their water balance, and have even been seen drinking dew.

With so much effort invested in retaining water, staying cool and keeping their metabolic rates in check, larks have had to adopt a number of unusual behaviours. Some species, such as Gray's Lark, specialise in displaying only in the pre-dawn and post-dusk light to reduce energy expenditure. All larks try to rest during the hot and parched midday. Perching on bushes to avoid the hot ground and increasing their exposure to a breeze is one way of staying cool. In Saudi Arabia, larks are known to rest on the leaves of plants in the cucumber family, as they have deep roots that reach the water table and are considerably cooler than the surrounding environment. Spike-heeled Larks use burrows of ground squirrels and Hoopoe Larks those of lizards to avoid the extremes of the midday environment. By going underground to a depth of 30 centimetres and remaining there for five hours, a Hoopoe Lark may reduce its water loss by some 80 per cent.

Larks are amazing and they encapsulate the lost art of birdwatching, but only if you are prepared to stop and study them. So the next time you see a lark, don't just dismiss it as an LBJ avoiding identification. Instead, watch it for a while and see if in it you can discover a survivor, a songster or a storyteller. □

Opposite, top A Karoo Lark performing its energy-sapping display flight. Upon landing, it uses its specialised camouflage to blend in with the sand and vegetation of its habitat.

Opposite, middle The sexes of Raso Lark (male, left; female, right) have bills that differ so markedly in their size and shape that the birds are able to forage as separate species. This is just as well, because the resources on the tiny islet on which this species survives are under serious pressure.

Opposite, bottom The Greater Hoopoe Lark has a hefty bill designed for digging in the Sahara's soft sands and long legs that enable it to run great distances. It is a remarkable bird, with a highly adaptive physiology that helps it survive in its desert world.