

Printed from



Kenyans, Ethiopians carry oxygen in their body tissues for longer periods

22 Aug 2008, 0045 hrs IST, Subodh Varma & Atul Thakur,TNN

It's the world's most exclusive club — those who have ever run the 100m dash in less than 10 seconds. And there's no white man in it. All 64 members of this club, led by Usain Bolt, who set a world record at Beijing, are black.

In 200m, only 37 runners have ever finished below 20 seconds, and 35 of them are black. In the middle distance races of 400, 800 and 1,500 metres, you may find a few whites. But in the long distance endurance races like 5,000 and 10,000 metres, again there are no whites among those holding the top 50 timings.

In events that involve sheer strength, like shot put, discus, javelin and hammer throw, the situation is exactly the opposite. There is not a single black in the top 50 records in hammer throw and javelin, while there is only one black each in shot put and discus.

Among women, the situation is similar though not marked by such extreme polarization. Women runners from the erstwhile socialist bloc, and now from China, figure in the top 50, but there is a predominance of black athletes.

In the last three decades, athletics, like all sports, has become more and more globalised. Athletes from many small countries are participating in international competitions, and technologies are more freely accessible, although at steep costs. In this levelling of the playing field, the rise of black power has stunned the world once used to seeing only whites on the podium.

What is behind this polarization? Is it in the genes or is it the desire to win?

The dominance of non-white athletes in race events has come under huge scrutiny by scientists and sociologists in the past decade. Over 200 scientific studies have been carried out and many more are going on. The truth is still out there somewhere.

The association of skin colour with a genetic structure suited for athletics has not been established. This is more so because among the black athletes, there are two very distinct categories — those from East Africa, who dominate long distance running, and those of West African ancestry who dominate sprints. Most athletes from the Caribbean and North America belong to the latter category as their ancestors were taken to the New World as slaves between the 15th and 19th centuries. The average West African weighs 30kg more than average East Africans, who are small with thin legs and arms.

Studies of East African long distance runners, mainly from Kenya and Ethiopia, have shown that they have the capacity to carry oxygen in their body tissues for longer periods. According to a study by Yanna Pitsiladis, director of the International Centre for East African Running Science (ICEARS), this appears to be a result of living at a higher altitude and constantly running since childhood.

All elite Kenyan and Ethiopian runners have grown up in locations that are up to 2,500 meters above sea level. Among the Kalenjin people in the Western Highlands of Kenya, people run practically all their lives, starting from going to school.

Pitsiladis carried out mitochondrial DNA and Y-chromosome analysis of over 400 DNA samples from Kenya, including elite runners, looking for some genetic differences. "There is no evidence to date of a genetic phenomenon," he told *TOI*.

Training systems also help in developing certain abilities like the stunning burst of speed of East African long distance runners at the fag end of a gruelling run. Timothy Noakes of the University of Cape Town told *TOI* that these athletes train in such a way that they are able to keep some muscle units unused till the end.

So, while other runners are suffering from exhaustion of the relevant muscles, the East Africans bring into play a fresh set of muscle fibres. They also appear to maintain speed at high concentrations of lactate — which builds up in the muscles and leads to fatigue — unlike whites or West Africans.

Studies indicate that sprinters of West African descent have a higher proportion of fast-twitch muscles that are useful in short explosive bursts, but tire out very quickly after that.

Whites, on average, have larger and more muscular upper-bodies, with relatively shorter arms and legs. This gives them an advantage in sports needing strength rather than speed — weightlifting, wrestling and throw events like the shot put and hammer. This physiology is also suited for swimming, another sport dominated by whites.

Some of the intriguing theories that are still under test include the role of enzymes like angiotensin converting enzyme (ACE). Eritrean runners have been found to contain a version of the ACE-producing gene that causes better oxygen consumption suitable for endurance running. Similarly, a study by Kathryn North of Australia showed that a protein called ACTN-3, which helps in producing short bursts of energy, was more prevalent in sprinters from West Africa. But nothing conclusive has emerged.

As Yann C Klimentidis, a human evolutionary scientist at the University of New Mexico, told *TOI*, "It has been difficult to determine what, if any, genetic factors may account for the success of runners of African ancestry. These are questions that have been asked and some genes have been proposed, but results have been inconclusive." Most researchers agree that external factors and not genes are the key to performance. Access to technology and facilities is the singlemost important factor. This combined with training can lead to high performance levels, as shown by China.

Gertrud Pfister, professor, department of exercise & sports, University of Copenhagen points out that even motivation, the way of thinking and orientation are important in determining performance. "In some societies, like India, with a more contemplative orientation, physical skills and sporting performance do not seem so important," she says.

About Us | Advertise with Us | Careers @ TIL | Terms of Use | Privacy Policy | Feedback | Sitemap
 Copyright © 2008 Bennett Coleman & Co. Ltd. All rights reserved. For reprint rights: Times Syndication Service
 This site is best viewed with Internet Explorer 6.0 or higher, Firefox 2.0 or higher at a minimum screen resolution of 1024x768