humanity. The King Faisal Foundation awards International Prizes each year for Service to Islam, Islamic Studies, Arabic Literature, Medicine and Science. The Prize for Science rotates among the fields of physics, mathematics, chemistry and biology[6]. Within three decades the KFIP are ranked among the most prestigious awards. To date there are 17 KFIP laureates who have also received Nobel Prizes (mostly after the KFIP). A total of 52 scholars from 12 countries have been awarded the King Faisal International Prize for Science. Mudumbai Seshachalu Narasimhan is the only Indian to have won the KFIP for science (in mathematics)[7,8].

The Science Prize for the year 2016 will be awarded in the field of biology. The topic for the Medicine prize is 'Clinical application of next-generation genetics'. The deadline for all nominations is 1 May 2015 and the details are at http://www.kff.com/ and http://www.kfip.org/

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Sameen Ahmed Khan, Engineering Department, Salalah College of Technology, Salalah, Sultanate of Oman.
e-mail: rohelakhan@yahoo.com

A close look at Darwin's finches

The key gene responsible for varying beak shapes in Darwin's finches has been finally identified and sequenced.

A team of scientists[1], that includes the well-known evolutionary biologists Rosemary and Peter Grant, have identified the gene responsible for the diversity in beak shapes and sizes in Darwin's finches.

Charles Darwin observed these finches on the Galapagos Islands, which though looked similar to one another, had beaks of different shapes and in varying sizes, to accommodate specialized diets. His observation of these finches is believed to be the key inspiration on his formulating the theory of natural selection.

Presently, there are 15 recognized species of Darwin's finches that have evolved from a common ancestor (Figure 1). They are the best model species to showcase the process of speciation and adaptive radiation. Adaptive radiation is a process where a species rapidly undergoes morphological changes in order to cope or to exploit the sudden changes in its environment. The process of adaptive radiation in case of Darwin's finches was accelerated due to strong geographical isolation on the islands that were created from volcanic activity. As a result, each of the 15 species has evolved a different shaped beak to accommodate a specific diet. Here the adaptation was driven by the availability of different food resources.

Genetic samples from 120 individuals including all of Darwin's finched were collected from the Galapagos archipelago and Cocos Island. Phylogenetic analyses of the genomic sequences reveal a few critical deviations from traditional taxonomy, which is based on the morphological features or the appearances of species. For example, it was found that the ground finch (*Geospiza difficilis*) whose range is spread across six islands in the Galapagos, actually comprises of three species. The study also revealed the mixed ancestry of these finches as a result of hybridization throughout their evolutionary period.

Further, genomic sequencing has helped scientists to identify the gene *ALX1*, to be the key driver of beak adaptation in the finches. During a series of droughts in the 1980s, that resulted in scarcity of food resources for the medium ground finch. Peter and Rosemary Grant observed that, the beak of the finch grew more pointed to enable it to adapt to a new diet. The *ALX1* gene exhibited two distinct variations that fitted neatly with the pointed and blunt beak adaptations in the finches. The genome of the medium ground finch, has a mixture of both pointed and blunt beak gene variants. The scientists thus believe that *ALX1* which is also found in other vertebrates including humans where it is associated with the development of facial structures, plays a major role in development of beak morphology in Darwin's finches.

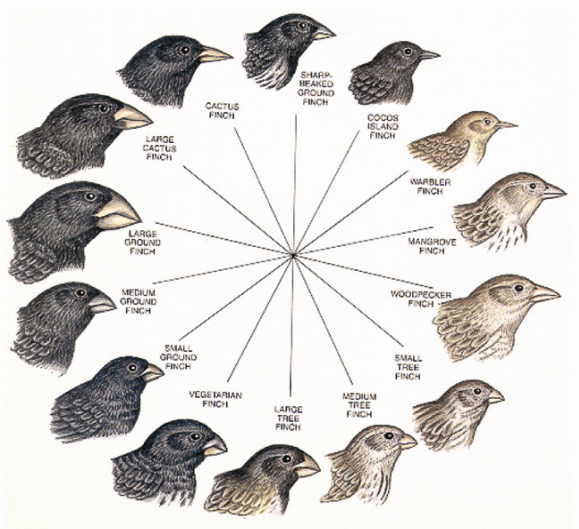

Figure 1. The 14 species of Darwin's finches found on the Galapagos archipelago. All the 14 species evolved from a common ancestor, but have undergone rapid adaptive radiation, modifying their beaks for specific food resources. Photo: http://cmuems.com/2014a/maj/09/21/generating-darwins-galapagos-finches/

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Ipsita Herlekar (*S. Ramaseshan Fellow*)
e-mail: iherlekar@gmail.com