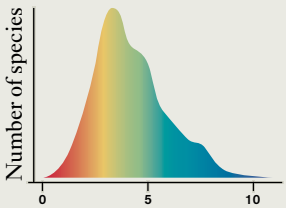
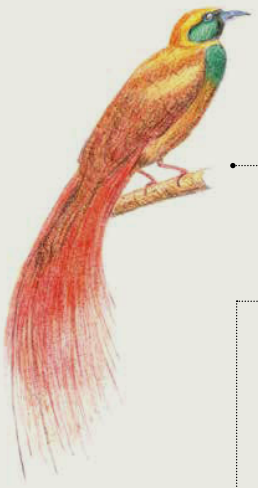
MYRIAD VOICES IN THE AVIAN CHOIR

There are as many different bird songs as there are bird species. In this circular family tree of songbirds (Passeriformes), those species with low voices are highlighted in red, and those with high voices in blue. The distribution of the colors reveals that neighboring – i.e., closely related – species within the family tree often have similar voice pitches. The pitch at which a particular bird sings is therefore largely determined by its ancestors' vocal pitch. (Each of the birds depicted represents one of ten groups within the Passeriformes order.)

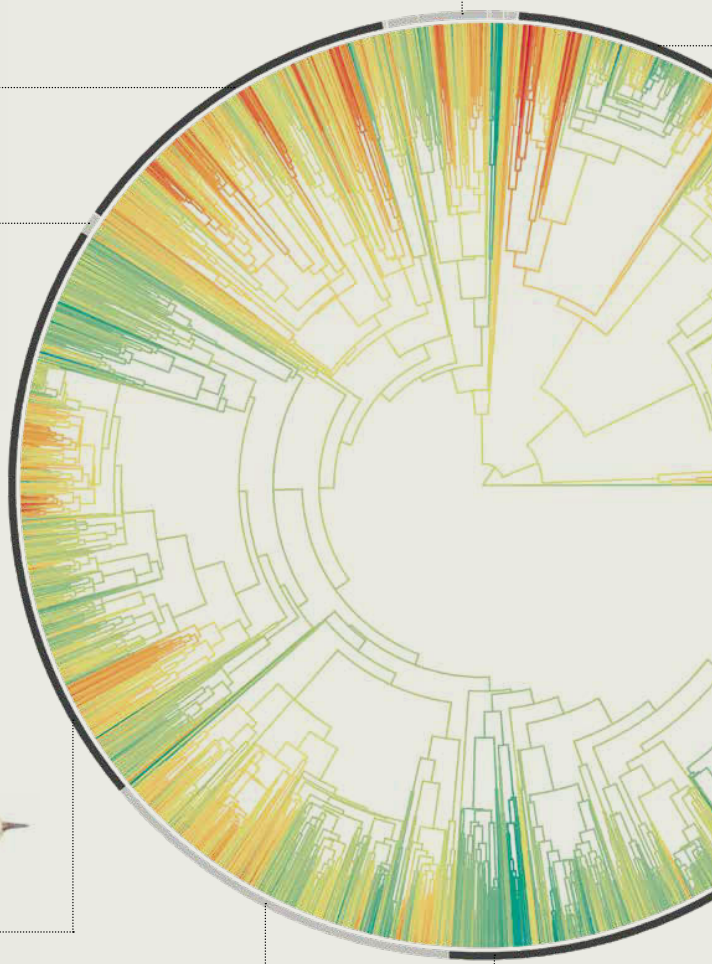


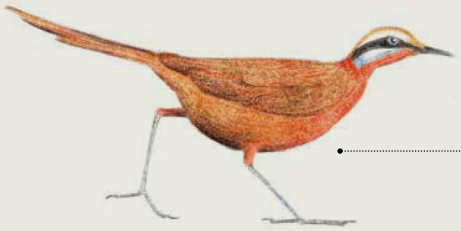
Maximum pitches of songbirds in kilohertz (kHz). (average: ca. 4 kHz)

Superb lyrebird
Australia
103 cm



Raggiana bird-of-paradise
Papua New Guinea
34 cm





Rail-babbler
Southeast Asia
29 cm

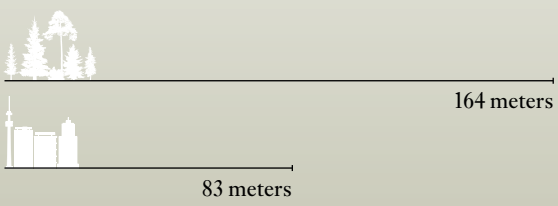
Rattling cisticola
Africa
14 cm

American robin
North America
25 cm

Cape May warbler
North America
13 cm

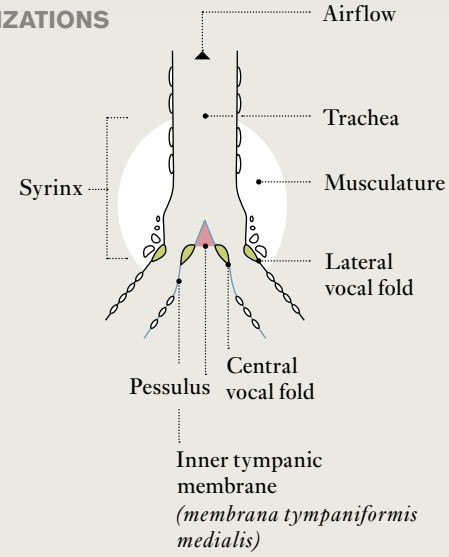
DIFFERENT ACOUSTICS

A blackbird in a forest can hear the song of another blackbird from over twice the distance as in the city, where the noise level is higher.

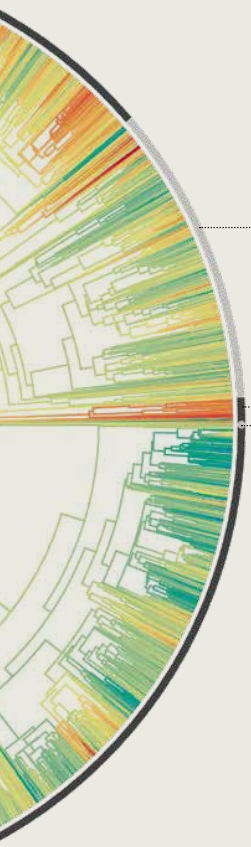


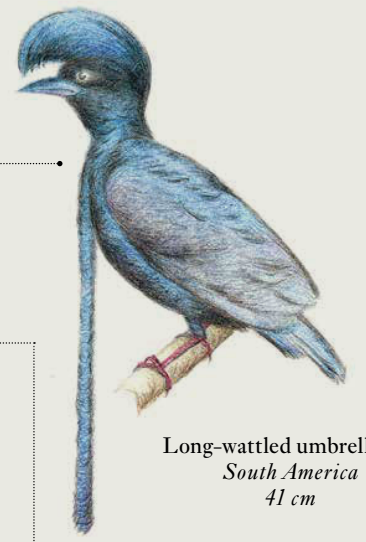
POLYPHONIC VOCALIZATIONS

To produce their songs, songbirds use the so-called syrinx, which is located at the fork of the trachea. The syrinx can produce a different sound in each of the two bronchi, so birds can produce two sounds simultaneously or switch rapidly from one to the other.



Red-billed scythebill
South America
25 cm





Long-wattled umbrellabird
South America
41 cm

Grey-headed broadbill
Africa
17 cm

New Zealand rock wren
New Zealand
10 cm

Human hearing range

20 kHz

11,9 kHz
HIGHEST BIRDSONG PITCH

4,6 kHz
Highest piccolo flute tone

0,04 kHz
Lowest double bass tone

LOWEST BIRDSONG PITCH

0,2 kHz

0,02 kHz

Golden-winged manakin
South America

Bare-necked Umbrella Bird
Central America

OTHER INFLUENCES

In addition to evolutionary history, the song pitch of a given bird species also depends to a large extent on its size, and therefore on that of its syrinx. The size difference between males and females also affects the maximum pitch.

SIZE

SEXUAL DIMORPHISM

GRAPHIC: GCO BASED ON MIKULA ET AL., ECOLOGY LETTERS 2020