



Application

(1): X—X, hibari music

EXOTAXA

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Species inquirenda

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Abstract

We describe a cricket of doubtful identity requiring further investigation. Our description suspended bioacoustics and music as investigative parameters dependent on environmental conditions. We present the first application of non-musicology from insect bioacoustics and North Indian classical music.

Key words: Chronobiology, Hindustani music, Phenology, Soundscape ecology

Introduction

True crickets, Orthoptera family Gryllidae Laicharting, 1781, are distributed throughout terrestrial biomes and known for creating chirping sounds by stridulations (Ewing 1999; Pollack 2017). The amplitudes, durations, frequencies, and rates of cricket calls are dependent on organismal and environmental factors, including age, time of day, season of year, and temperature (SINA 2020).

Hindustani classical music evolved from ritual Vedic chants over 1,000 years ago in North India (Bhatkhande 1990). Principles of Hindustani music include 10 *thāts* (seven-pitched modes), seven *swara* (pitches), 22 *śruti* (nearly inaudible pitch intervals), and innumerable *ragas* (melodic modes). Musicians perform ragas with swara according to thāts, which are dependent on time of day and season of year.

Materials and methods

One cricket chirp was created with Max 8 visual programming language (Cycling '74: San Francisco, California). Chirp amplitudes (0–∞ dB), durations (0.356995–1.070985 s), frequencies (0–38.2843 cents), pans (100% L–100% R), and rates (0.356995–1.070985 BPM) plus song durations (60–180 s), fades (10–30 s), and pauses (30–60 s) were randomized (May 1976).

Ten Hindustani thāts (*Asavari*, *Bhairav*, *Bhairavi*, *Bilawal*, *Kafi*, *Kalyan*, *Khamaj*, *Marva*, *Purvi*, and *Todi*) were programmed, fundamentals (*Sa*) were tuned, and eight frequencies (swara, plus *Sa* ') were randomly tuned to 22 śruti ratios (Datta *et al.* 2006). Thāts were randomly selected and performed according to traditional times (*samay*) and eight subdivisions (*prahara*) of the day (Kauffman 1968).

Instructions for Mac OS X

Download and open application, input “Fundamental” (default = 2217.46, Hz; ~C#) or select “Microphone” to tune, select “Octave” (default = +0), select “ON” to activate, select “START” to fade in, select “STOP” to fade out, and select “OFF” to deactivate; select “DSP” for audio status; view “Display”.

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