



**HAL**  
open science

## Videofiberoptic laryngeal data and acoustic analysis of the ornamentations used in Mongolian Long Song

Claire Pillot-Loiseau, Lise Crevier-Buchman, Annie Rialland, Teresa Narantuya, Coralie Vincent, Alain Desjacques

### ► To cite this version:

Claire Pillot-Loiseau, Lise Crevier-Buchman, Annie Rialland, Teresa Narantuya, Coralie Vincent, et al.. Videofiberoptic laryngeal data and acoustic analysis of the ornamentations used in Mongolian Long Song. The Voice Foundation's 39th Annual Symposium: Care of the Professional Voice, Jun 2010, Philadelphie, United States. pp.175. hal-00530208

**HAL Id: hal-00530208**

**<https://hal.science/hal-00530208>**

Submitted on 27 Oct 2010

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## Videofiberoptic Laryngeal Data and Acoustic Analysis of the Ornamentations used in Mongolian Long Song

Pillot-Loiseau, Claire<sup>1</sup>; Crevier-Buchman, Lise<sup>1,2</sup>; Rialland, Annie<sup>1</sup>; Narantuya<sup>3</sup>; Vincent, Coralie<sup>1</sup>; Desjacques, Alain<sup>4</sup>

**Objective.** The paper presents the results of a multiparametrical analysis of "Mongolian Long song", a long and slow versified melody with multiple ornamentations.

**Method.** The study includes: (1) a physiological analysis (videofiberoptic laryngeal data of the 61 ornamentations of a song produced by a famous Mongolian singer, Narantuya, and video recordings of the singer); (2) an acoustical analysis (fundamental frequency and intensity curves of the ornamentations).

**Results.** The fiberoptic analysis showed two main laryngeal behaviour in producing ornamentations, with a leitmotiv: (1) "lyrical" vibratos mobilizing the entire laryngeal block; (2) "Mongolian" trills with essentially supraglottic movements, the arytenoids being mobilized independently of the rest of the laryngeal block. These movements contrasted with the absence of cervico-scapular movement of the singer.

The acoustic analysis showed: (1) for the "lyrical" vibrato: the fundamental frequency and the intensity were in-phase, with a moderate amplitude (1 to 3 semitones for the fundamental frequency, 4 to 6 dB for the intensity; 5 to 6 modulations/s); (2) for the "Mongolian" trill: the fundamental frequency and the intensity were in opposite phase, with an important amplitude (3.5 to 4.5 semitones for the fundamental frequency, 6 to 10 dB for the intensity; and 6 to 7 modulations/s) and acoustical indications of changes of laryngeal vibratory mechanisms.

**Conclusion.** In this multiparametrical study of Mongolian Long song with previously unpublished physiological data, we defined two ornamentations used by the singer in the same melody, corresponding to different laryngeal movements and different acoustic characteristics: "lyrical" vibrato and "Mongolian arytenoidian" trill.

Claire Pillot-Loiseau, PhD, Assistant Professor, Phonetics, Speech Therapist, Phonetics and Phonology Laboratory, UMR 7018, CNRS/Sorbonne-Nouvelle, 19 rue des Bernardins, 75005, Paris, France, +33 1 6 82 07 31 98, [claire.pillot@univ-paris3.fr](mailto:claire.pillot@univ-paris3.fr)

Lise Crevier-Buchman, MD, PhD, CNRS Researcher, Phonetics, Phoniatician, Phonetics and Phonology Laboratory, UMR 7018, CNRS/Sorbonne-Nouvelle, Pitié-Salpêtrière Hospital, 2 European Georges, 19 rue des Bernardins, 75005, Paris, France, + 33 1 56 09 34 53, [lise.buchman@numericable.fr](mailto:lise.buchman@numericable.fr)

Annie Rialland, PhD, CNRS Researcher, Phonetics, Phonetics and Phonology Laboratory, UMR 7018, CNRS/Sorbonne-Nouvelle, 19 rue des Bernardins, 75005, Paris, France, + 33 1 44 32 05 76, [annie.rialland@univ-paris3.fr](mailto:annie.rialland@univ-paris3.fr)

Narantuya, Singer, Hohhot's Music Academy, Hohhot, Mongolia

Coralie Vincent, Engineer Sound's Diploma, Engineer, Phonetics and Phonology Laboratory, UMR 7018, CNRS/Sorbonne-Nouvelle, 19 rue des Bernardins, 75005, Paris, France, + 33 1 43 26 37 80, [coralie.vincent@univ-paris3.fr](mailto:coralie.vincent@univ-paris3.fr)

Alain Desjacques, PhD, Asst. Professor, Ethnomusicology, Lille 3 University, SELOEN Laboratory, BP 149, 59653, Villeneuve d'Ascq, France, + 33 3 20 41 60 00, [alain.desjacques@univ-lille3.fr](mailto:alain.desjacques@univ-lille3.fr)