

A «WHISTLING LANGUAGE» IN THE VILLAGE ANTIAS IN THE GREEK ISLAND OF EVIA

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The following instrumental acoustical analysis, concerning the «whistling language» of the village Antias in the Greek island of Evia has been internationally done for the first time.

The fact that such a study of a «whistling language» has not been elaborated until now is mainly due to the difficulty of finding the proper spectral corpus. In the aforementioned «whistling language» the distinction of vowels is easy and about similar to the corresponding one of the natural languages. The only difference is the transposition of the harmonics to the higher values of frequency. On the contrary, the distinction of the consonants is very difficult. The presence of the consonants becomes clear with difficulty and only by their transition curves.

1. Historical data

Antias is a village in the province of Karystia in the island of Evia (Greece). There is a number of points of view about the origin of the Antias' inhabitants. Stam. Karatzas, late professor at the University of Ioannina, after having studied comparatively the native dialect with all its idioms, came to the conclusion that it differs from all dialects in the Antias' vicinity and, taking into consideration a number of historical data admits that Canale, the admiral of Venice transported captives from Ainos in Thrace to Antias - an area of Evia island in 1469.

C. Charalambakis, professor at the University of Crete, refers that the communication between Antias inhabitants by means of whistlings is a unique phenomenon all over Greece.

Here we must mention that there are references about the «whistling languages» of the following five places:

- (i) Gomera, an island of the Canary archipelago
- (ii) Aas area on the Pyrenees mountains (France)
- (iii) Kickapoo in North America
- (iv) Chepang in Tibet, and
- (v) Tepehka and Mazateco in Mexico.

Recently, a «whistling language» has been discovered in Kusköy, a village situated in the Görel valley (Turkey), 30 km away from Black Sea.

G. Amargianakis, professor at the University of Crete, writes: «the common element of all "whistling languages" is that they do not constitute a distinct communication-code with the meaning that they present morphological and semasiological peculiarities, but they simply substitute the local dialect by whistlings...». All these «languages»

were derived by the necessity for messages to be conveyed throughout mountainous or difficult of approach regions, or to straggling villages as well.

As far as the «whistling language» of Antias' inhabitants is concerned, from an acoustical point of view, it is a simplified variation of their speech, which means that the vocabulary, the syntax and in a great degree the phonology are not differentiated from the natural speech.

Up to the present day there has not been any scientific acoustical approach to the aforementioned «whistling language». The only acoustical data, without any instrumental ascertainment, is an oral impression of professor G. Amargianakis, which concerns the low pitch of the vowel [a] and the high one of the vowel [i].

In this paper we start an instrumental acoustical approach and study of the Antias' «whistling language».

2. Spectral analysis of the Antias' «whistling language»

Carefully selected «whistling words» and «sentences» were analyzed in the Phonological Laboratory of the Technological Institute of Thessaloniki. These «words» and «sentences» have been taken from a cassette with whistling-recordings, made by professors C. Charalambakis and G. Amargianakis themselves in the Antias village. For this purpose the digital Sonagraph 7800 of the KAY company and the recorder 7900 of the same company were used*.

The spectral analysis of the word [vazɔ], as it is spoken in the Greek natural language and as it is whistled in the Antias' «whistling language», is demonstrated in fig. 1. The spectra are three-dimensional. X axis represents time ($t_{max} = 2.56$ sec), Y axis is for the frequency in Hz, and Z axis (blackness) represents amplitude in db. The spectrum time wave and amplitude display is also demonstrated on the upper half of the same figure.

Similar data of analysis, describing the word [zimari], are given in fig. 2a. The contour spectrum of the same word (zimari) is demonstrated in fig. 2b. In the contour spectrum — which is an advantage of the digital Sonagraph 7800 — the X axis also represents time ($t_{max} = 2.56$ sec) and the Y axis is for the frequency in seven amplitude-levels with a step of 6-db's. The first three harmonics have already become clear in the contour spectrum.

In figures 3a and 3b the same spectral data are given, as previously, but now it is concerned with the word [ðasɔs].

Finally, in figures 4a and 4b the word [ɣɔnis] is spectrally described.

3. Results and discussion

Based on the juxtaposed figures 1 up to 4, we can make the following comments:

(i) There is a clear distinction between the amplitude display or the time wave spectrum of the Greek natural language and the ones of the «whistling language». As far as the natural language is concerned, the amplitude display grows less in the conson-

* We want to thank Professors C. Charalambakis and G. Amargianakis who have kindly provided us with the recorded material.

ants' places. On the contrary, the amplitude display remains everywhere flat either a vowel or a consonant exists. So, we can get no definite information.

In our opinion this is due to the fact that the whistling sound comes out of a constant-volume cavity, because the oral cavity does not open and shut. The only volume-changing is due to the shape and position of the tongue. There are three parameters that can be said to characterise vocal track shapes [4]:

- (1) the size (in cm^2) of the minimum cross sectional area A_{min} ,
- (2) the location of A_{min} in terms of its distance, L , (in cm) from the glottis,
- (3) the magnitude of the lip opening, A_{lip} (in cm).

Only two from the three aforementioned parameters change in the «whistling language» of Antias, while the third one, A_{lip} , remains constant.

(ii) All vowels have three distinct harmonics, which become more clear in the contour spectrum. These three harmonics are found in the frequency-range of 2 up to 5 KHz, while the first three harmonics of the vowels in natural languages are placed in the frequency-range of 600 up to 3500 Hz.

(iii) The distinction of vowels and consonants becomes difficult enough in the «whistling language» in contradiction to natural languages, where a spectrum does always exist, having either harmonic frequencies or frequencial-bands [3].

In our opinion, the distinction of the consonants in the Antias' «whistling language» must be based on the transition curves (for example look at the transition curve of the consonant [n] between the vowels [ɔ] and [i] in the word [γɔnis]), which means that for each consonant there is a different transition curve for the passing from its previous vowel to the next one. Each consonant is exactly determined by the inclination and the shape of its transition curve.

A great oral discriminating ability is claimed by a listener in order for a consonant to be localized in a «whistling word». This is, on the one hand, the reason to explain why it is difficult to learn this «whistling language» and on the other why this «whistling language», little by little, is disappeared. Besides, the coming civilization to Antias village eliminates all reasons which compelled Antias' inhabitants to preserve the «whistling language».

4. Conclusions

The above instrumental acoustical analysis, concerning the «whistling language» of the village of Antias in the Greek island Evia has been done for the first time and this is the reason to explain the limited references.

The fact that such a study of a «whistling language» has not been elaborated until now is mainly due to the difficulty of finding the proper spectral corpus.

In the above mentioned «whistling language» the distinction of vowels is easy and about similar to the corresponding one of the natural languages. The only difference is the transposition of the harmonics to the higher values of frequency.

On the contrary, the distinction of the consonants is very difficult. The presence of the consonants becomes hard clear and only by means of their transition curves.

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FIGURE-CAPTIONS

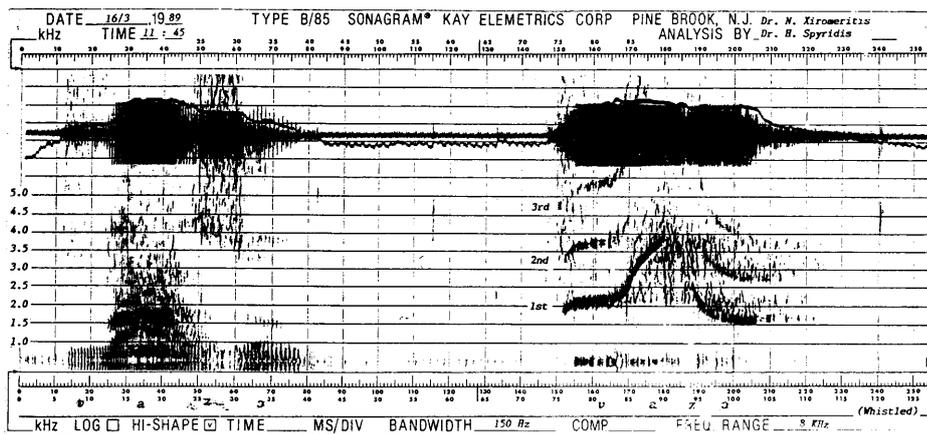


Fig. 1. The spectral analysis of the word [vaz], as it is spoken in the Greek natural language and as it is whistled.

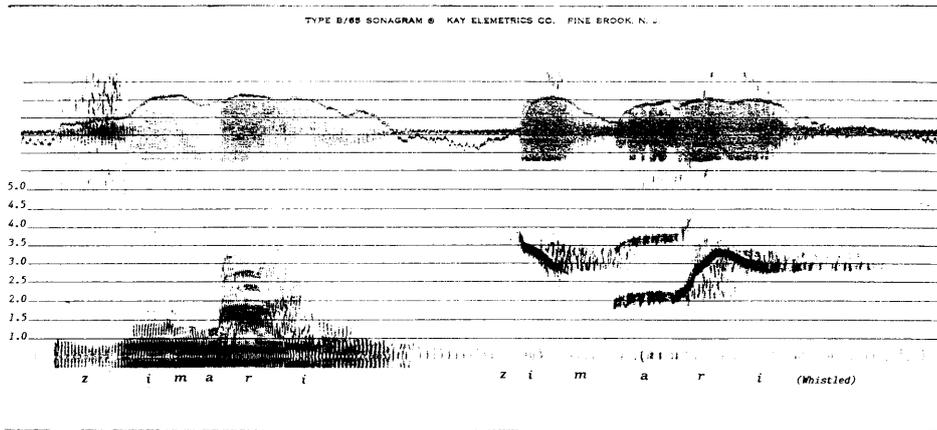


Fig. 2a. The spectral analysis of the word [zimari], as it is spoken in the Greek natural language and as it is whistled.

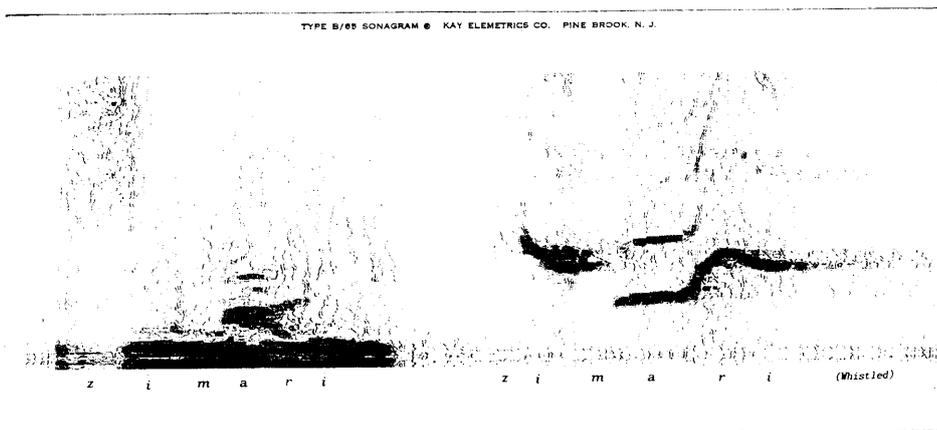


Fig. 2b. The contour spectrum of the same word [zimari], which is demonstrated in fig. 2a.

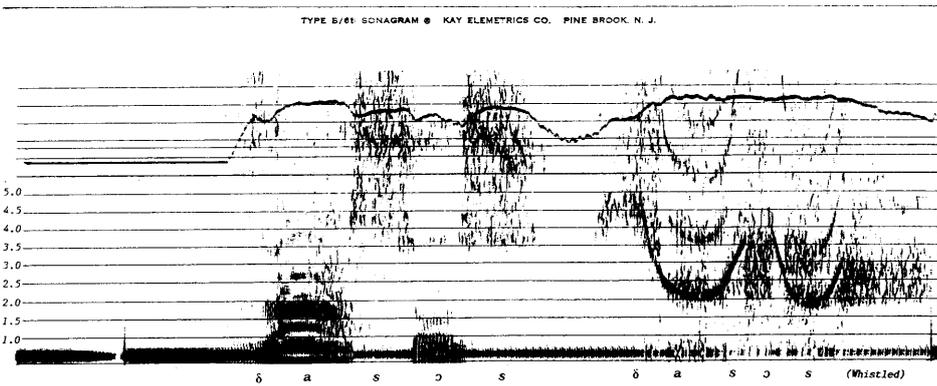


Fig. 3a. The spectral analysis of the word [δασος], as it is spoken in the Greek natural language and as it is whistled.

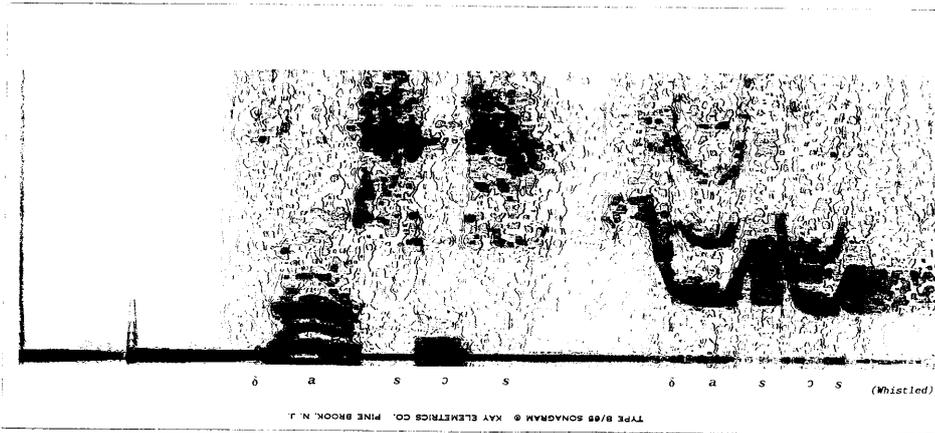


Fig. 3b. The contour spectrum of the same word [δασος], which is demonstrated in fig. 3a.

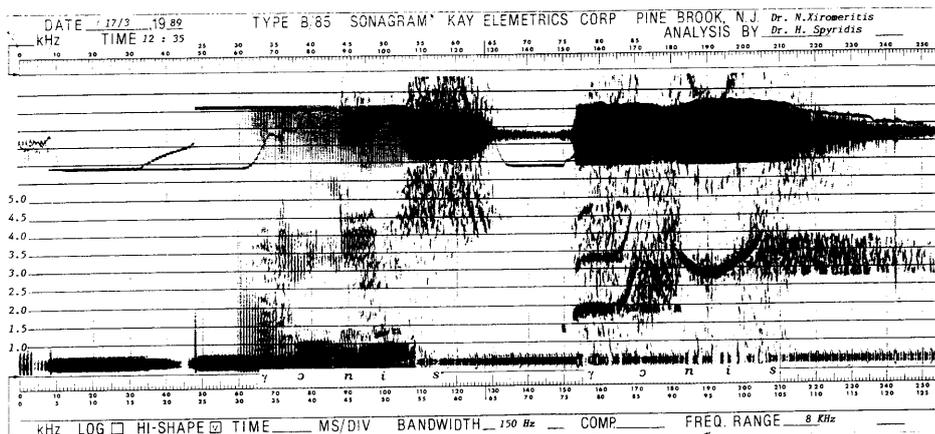


Fig. 4a. The spectral analysis of the word [γονις], as it is spoken in the Greek natural language and as it is whistled.

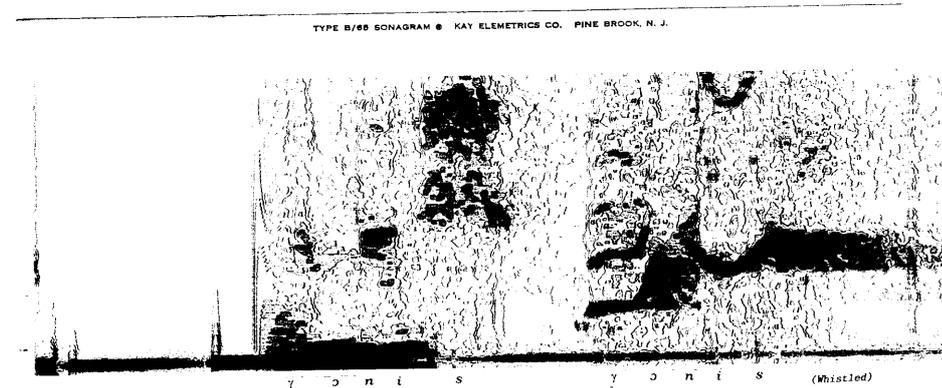


Fig. 4b. The contour spectrum of the same word [γονις], which is demonstrated in fig. 4a.