

## Retroflexion in Q'anjob'al Obstruents

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The retroflex obstruents of Mayan have not yet been included in the substantial literature on the articulatory and acoustic properties of retroflex consonants (cf. Hamann, 2003). In this talk I will present articulatory and acoustic information about this class of sounds in Q'anjob'al. Based on this admittedly small dataset (one language, one speaker), I will attempt to situate the Mayan retroflex in the phonetic typology of retroflexes. I hope that the presentation of these data will stimulate other hypotheses regarding the diverse set of Mayan coronal obstruents, including the retroflexes.

In Mayan, retroflex obstruents are found exclusively in the Kanjobal (KAN) and Mamean families. Languages with this class of sounds, like Q'anjob'al, have at most one voiceless retroflex fricative and two voiceless retroflex affricates (pulmonic and ejective). Historically, the retroflex fricative comes from the Proto-Mayan (PM) voiceless alveopalatal fricative, whereas the ejective and pulmonic affricates are reflexes of the ejective and pulmonic voiceless alveolar and alveopalatal affricates (Campbell 1984). (PM did not have any retroflex obstruents, according to Campbell's reconstruction.) In Q'anjob'al, at least, the retroflex obstruents contrast with a relatively large number of other coronals, including an alveopalatal fricative in Spanish loans (e.g., *xhalu* < *jarra* 'jug'). For this reason, it is possible to observe the Q'anjob'al contrast between alveolar, alveopalatal, and retroflex fricatives. Because the palatalized alveolars of PM became alveopalatal affricates in KAN, the same three-way contrast can be observed in Q'anjob'al affricates.

The label "retroflex" is noted for its wide variety of phonetic definitions: its place of articulation is pre-palatal in a number of Australian languages, alveolar or post-alveolar in others (Butcher 1995); the active articulator is the apex of the tongue in Hindi (Ladefoged and Bhaskarao 1983), subapical in Norwegian (Simonsens et al. 2008), Tamil and Telugu (Ladefoged and Bhaskarao 1983), and Toda (Ladefoged and Maddieson 1996). Some consonants widely described as "retroflex" (Chinese, Polish) do not meet an important articulatory standard for this sound—apicality (Ladefoged and Maddieson 1996). Thus, the simplest research question regarding Mayan's retroflexes asks whether they are apical and thus truly retroflex.

Ladefoged and Maddieson (1996) describe two types of (true) retroflex fricatives, a sub-apical palatal and an apical post-alveolar (both in Toda). Hamann (2003) outlines four articulatory properties of retroflexion: apicality, posteriority, sublingual cavity, and retraction. Based on the results of the present study, the retroflexes of Q'anjob'al appear to satisfy these properties. There is some evidence that the Q'anjob'al retroflex fricative is sub-apical, a possible counterexample to Hamann's (2004) claim that "[a] retroflex fricative with a curling back of the tongue tip... does not seem to occur in any language" (p. 55).

I will present acoustic and articulatory data (EPG using real words; static MRI using sustained articulations) on the Q'anjob'al retroflexes. Data were gathered from one speaker of Q'anjob'al residing in the United States. I conclude that the three-way coronal contrast in Q'anjob'al can be specified in terms of diminishing spectral center of gravity: (1) alveolar > (2) alveopalatal > (3) retroflex. According to EPG results, the place of articulation of these consonants is (1) alveolar /dental, (2) post-alveolar, and (3) post-alveolar. The lingual articulator is (1) apical, (2) laminal, and (3) sub-apical. The retroflex has the deepest sublingual cavity, followed by the alveopalatal, then the alveolar. The data presented on the sub-apical retroflex fricative of Q'anjob'al could be the first documentary evidence of such a sound (Figure 1).



**Figure 1.** Static MRI tracing of Q'anjob'al fricatives: red = sub-apical retroflex; green = lamino-alveopalatal.

### References

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