



FIG. 7. Natural and corresponding “syllable reversed” calls for two species of penguins that do not have a nest. Only the king penguin signal with syllable reversed does not elicit positive responses during individual recognition tests.

the syllable is sufficient to provide individual information (Jouventin *et al.*, 1999; Lengagne *et al.*, 2000). At the opposite extreme, the display call of the emperor penguin is the only one where several successive syllables (at least three; Hildebrand, personal communication) are needed to elicit recognition. Effectively, to identify the signal, emperor penguins examine the temporal succession of syllables (Jouventin, 1972, 1982; Jouventin *et al.*, 1979).

Display calls of penguins (emperor penguin calls included) appear to be highly redundant, consisting of more or less identical successive syllables with a repetition of the same information many times. This redundancy