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Vocal behaviour of rutting male goitred gazelles (*Gazella subgutturosa*) reveals mate quality.

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In goitred gazelles and in few other polygynous ruminants, male larynges are larger and descended to a lower resting position than those of females. Owing to larger vocal folds, males produce calls with a lower fundamental frequency. Additional momentary descent of the larynx further elongates the male vocal tract entailing lower formant frequencies. Decreased formant frequencies of rutting calls are assumed to exaggerate the apparent size of a caller and more effectively deter rival males and attract estrous females. Studies of the rutting behaviour of free ranging goitred gazelles in Uzbekistan revealed that adult rutting males dynamically retract the larynx down to the sternum and, thereby, elongate the vocal tract by 320-460 mm. This decreased formant dispersion to 382 Hz. Rutting calls were of low intensity and inaudible at distances greater than 150 m. Males produced these calls at close distance (10-15 m) to females and rivals. These data contradict the vocal size exaggeration hypothesis, because target conspecifics were able to estimate real size of a caller visually. The male larynx enlarged by 50% during the rutting period. Owing to the long vocal folds (35 mm) rutting calls were of very low fundamental frequency: 22.0 ± 2.58 Hz. As the larynx can grow independently from the body, the fundamental frequency is not a good indicator of body size. However, it is a potential indicator of testosterone. High levels of testosterone support male aggressiveness and promote high reproductive success. The size of the laryngeal cartilages positively correlate with testosterone levels. Therefore, the level of testosterone may be indicated in two ways: visually by the enlarged larynx and vocally by the low fundamental frequency. Supported by RFBR grant 09-04-00416.