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Domestication effects to vocalisation toward humans in the red fox *Vulpes vulpes*

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With their long evolution as independent species, the domestic dog *Canis familiaris* and its wild ancestor timber wolf *Canis lupus* do not represent a good model for studying the effects of captivity and domestication to vocalization in canids. Ideally, the domesticated and undomesticated individuals *within* species should be compared. So, we compared the calling activity and occurrence of different call types in human-related context in 104 captive adult female red foxes, derived from five selection groups: 25 "tame" (selected for tame behaviour toward humans, 44 - 45 generation since the start of selection); 25 "aggressive" (selected for aggressive behaviour toward humans; 34 - 35 generation since the start of selection); 10 "hybrid" (cross-breeding of tame and aggressive foxes); 19 "backcross" (cross-breeding of tame and hybrid foxes) and 25 "wild", unselected for behaviour control. The calls were recorded in July - August 2005 by the same, unfamiliar to foxes researcher, during a single record session per animal. The researcher approached to a focal fox cage and started the recording, lasted from 4 to 6 minutes. Within each record, stored as a separate file, we assigned calls visually to eight structural types, measured their duration and checked them for the presence of nonlinear phenomena and/or articulation effects. In total, we analyzed 18,072 calls. The foxes produced five tonal (*whine*, *moo*, *cackle*, *growl* and *bark*) and three noisy (*pant*, *snort* and *cough*) call types. The *whine* and *moo* did occur in all the selection groups, the *cackle* and *pant* - only in the "hybrid" and "tame" foxes; whereas the *snort* and *cough* - nearly exclusively in the "aggressive" and "wild" foxes. The *bark* was the rarest call (only 0.08 % of all calls), registered only in two "aggressive" foxes. Therefore, the selection for aggressive behaviour did not affect the vocal behaviour of "aggressive" selection group in comparison with the "wild" control, whereas the selection for tame behaviour resulted in perfect changing in the vocal types' set produced toward humans. The vocal behaviour of "hybrid" and "backcross" foxes was very special, not intermediate between the parental forms. All foxes, selected by behaviour, showed significantly higher vocal activity in comparison with the "wild" control, consistently to Cohen and Fox (1976) hypothesis that domestication relaxes the selection pressure for silence, still acting in wild canids to prevent the attraction of predators and frightening the potential prey.

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