

## Environmental selection, the missing term in Darwinism

Jaroslav FLEGR

Department of Parasitology, Charles University, Viničná 7, CZ–128 44 Praha 2, Czech Republic

*Received April 4, 1996; accepted June 27, 1996  
Published October 29, 1996*

**Abstract.** A serious terminological and conceptual problem of evolutionary theory is pointed out. At the present, the sexual selection could be considered a special type of natural selection as well as an independent process operating in parallel with natural selection. Some people use the term „natural“ in the sense „nonartificial“, „native“ while others in the sense „caused by nature, by the biotic or abiotic factors of environment“. The origin of this discrepancy is clear. When Charles Darwin introduced the term „sexual selection“ as the name for the process accompanying the competition among members of the same sex for mating opportunities, he failed to introduce a complementary term for all other forms of nonartificial selection. According to my opinion the term natural selection should stay reserved for its original purpose, as the general term covering all forms of nonartificial selection. There are no problems with its special form, sexual selection. For all other types of natural selection a new term – environmental selection should be introduced.

### Evolution, sexual selection, natural selection, environmental selection

Whenever the problems of sexual selection are discussed, the author faces a serious terminological problem. Sexual selection could be considered either a special type of natural selection or an independent process operating in parallel with natural selection. Both concepts have their proponents and opponents, and both can be supported by historical and logical arguments.

It can be claimed that there is nothing „unnatural“ about sexual selection. Darwin introduced the term natural selection as a name for a process operating analogously to a process of artificial selection, but without human intervention. According to this criterion, sexual selection should be considered as a particular type of natural selection. In fact, selection in favour of individuals with the best abilities to find their sexual partners is in principle the same as selection in favour of individuals with the best abilities to escape their enemies or to use their food effectively. The only reason we use the term sexual selection, but not escape selection or food-utilization selection, is that the former sometimes brings into existence colourful feathers in birds while the latter usually result in invisible adjustments of nervous system or of metabolic pathways.

It can also be argued, however, that Darwin introduced the term and the concept of sexual selection just to explain the existence of biological structures their origin cannot be explained by the process of natural selection. Reading the book „The descent of man and selection in relation to sex,“ (Darwin 1871) one quickly realizes that Darwin considered sexual selection as a process similar to, but distinct from, natural selection. Moreover, at least one basic difference exists between natural and sexual selection. The former can only be responsible for the origin of structures and behavioural patterns, which positively influence the fitness of the organism. The latter, as well as artificial selection, can sometimes negatively influence this parameter.

Terminological problems are not subjects which scientists usually enjoy to play with. However, in this case, making an exception might be useful. The reasons why differences in opinion on sexual selection cannot be settled, are really basic. Natural selection, the central term in modern theories of biological evolution, is understood in two different ways. Some people use

this term in the sense „nonartificial, native.“ Others use the word „natural“ in the meaning „caused by nature, by the biotic or abiotic factors of environment.“ Both are right. The fault lies with Charles Darwin. When he introduced the term sexual selection as the name for the process accompanying the competition among members of the same sex for mating opportunities, he failed to introduce a complementary term for all other forms of nonartificial selection. Instead, he continued to use the term natural selection (sometimes ordinary selection) in this context. Darwin probably did not realize, or at least did not explicitly state, that he started to use this old term in a new, more restricted meaning.

From a technical point of view, there is no problem in correcting evolutionary terminology. The term natural selection should stay reserved for its original purpose, as the general term covering all forms of nonartificial selection. There are no problems with its special form, sexual selection. For all other types of natural selection, a new term should be introduced. The term environmental selection would probably be suitable.

Knowing how often the absence of the term for environmental selection has been recognized and proper solution suggested might be interesting. It might be even more interesting to know why this solution has never been adopted.

#### REFERENCES

DARWIN C. 1871: *Descent of man, and selection in relation to sex. Vol. 1.* London: John Murray, 423 pp.