# Researchers establish how insects take advantage of the carrion left behind by carnivores

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A multidisciplinary team of Spanish researchers, including members of the Ecology Department of the Miguel Hernández University (UMH), has provided the first data on how scavenger insects and vertebrates share the carcasses of wild carnivore mammals.

In previous work, the researchers showed that "dog doesn't eat dog," in other words, that a majority of carnivores avoid consuming the carrion of other carnivores, especially of the same species. They say that this aversive behaviour has good reasoning behind it, as eating the carrion of another carnivore increases the probability of contracting deadly pathogens.

Now, the UMH researchers have tackled how other species take advantage of the carrion that wild carnivores do not want to consume. According to their conclusions, published in journal *Plos One*, the aversion of carnivore animals to eating other carnivores provides insects an excellent source of food.

To conduct this work, the researchers monitored and studied a total 20 fox carcasses in mountainous areas of the Spanish province of Murcia for several months in 2016. They monitored the carcasses with automatic photo-trap cameras that are triggered by movement. Furthermore, they visited carrion sites several times to study the evolution of the group of scavenger invertebrates as the days went by.

The results show that although the cameras captured several species of vertebrate scavengers such as the fox, stone marten or wild boar, the golden eagle was the only species that partially ate one of the carcasses. The research also shows how the absence of vertebrate scavengers around carrion enables the colonisation by a diverse group of necrophagous insects such as some species of flies or beetles, omnivores insects such as ants, necrophagous predators, mainly beetles drawn to cadavers but feed of the larvae and eggs of necrophagous insects instead of the carrion; and parasitoid insects, mainly certain species of wasps and beetles, which are also drawn to the cadavers but do not feed off carrion, as they are necrophagous insect parasites, thus eventually killing them.

In particular, 19 families of Diptera, beetles and Hymenoptera were observed. Among Diptera, the first colonisers of the carcasses, the so-called green or blue flies, were clearly predominant and colonised all the carcasses. Of the beetles, a total seven families were observed, with the most common being the silphidae (known as carrion beetles, who are generally secondary colonisers that reach the carcasses up to two weeks after their death), histeridae and staphylinidae (predators or larvae and other insects, and parasitoid pupas, that were present in greater numbers coinciding with high densities of larvae of flies they feed off) and dermestidae (which appear during the advanced stages of decomposition of the cadavers to feed off the remains of skin and other dry tissues). Lastly, the Hymenoptera family was represented by adults of the common wasp, a parasitoid wasp and several ant species.

**More information:** Carlos Muñoz-Lozano et al. Avoidance of carnivore carcasses by vertebrate scavengers enables colonization by a diverse community of carrion insects, *PLOS ONE* (2019). DOI: 10.1371/journal.pone.0221890