Kleptoparasitism

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Kleptoparasitism occurs in several groups of animals, such as birds, insects, and mammals, and is considered a form of social parasitism. The kleptoparasite benefits from the efforts of other animals to obtain food, without expending energy in searching and capturing these resources for itself. The term kleptoparasitism was introduced to describe the theft of food previously collected or processed by some other individual. Factors influencing kleptoparasitism: Environmental conditions. The number of potential hosts is about the number of kleptoparasites. The size of the kleptoparasite concerning the host. The number of kleptoparasites involved in a chase. Tactics used by the kleptoparasite. Nutritional quality of disputed prey [1-12].

Depending on the approach to gain access to the food, kleptoparasitism can be considered aggressive, also called overt theft, where force or threats are used to gain access to the food. It can also be classified when the resource obtained is exploited simultaneously by a predator and a kleptoparasite, with little or no violence. Several species of animals have this type of behavior, mainly when eating. However, to achieve this, some have characteristics of great skill, talent, and strategy. Kleptoparasitism can be intraspecific, involving theft of members of the same species, or interspecific, involving members of other species (Figure 1) [1-12].

Figure 1. *Promachus albifacies* (Diptera: Asilidae) the prey is a native bee of the genus*Agapostemon* Guérin-Méneville, 1844 (Hymenoptera: Halictidae), female, the ant is a genus *Pogonomyrmex* Mayr, 1868 (Hymenoptera: Formicidae) and of course, the fly is another member of the Chloropidae (Insecta: Diptera).

Sources: This photo taken on my property in Hereford Arizona at five thousand feet elevation Huachuca Mountains, Irina Brake-https://milichiidae.myspecies.info/irina-brake-cv and https://milichiidae.myspecies.info/file-colorboxed/3624.

Species of Phoridae (Insecta: Diptera) are kleptoparasites, that is, they use food collected by another insect to raise their offspring. The damage is caused by phorid larvae that feed on stored pollen and new bee brood discs containing liquid larval food. Phorid adults practically do not cause direct damage to Meliponini (Hymenoptera: Apidae). They have a fast life cycle, characteristic of kleptoparasitism, agility, and aggressive attack, and can be considered the greatest enemies of meliponiculture [1-12].

The species of the water cricket *Velia caprai* Tamanini, 1947 (Heteroptera: Veliidae) practice so-called group kleptoparasitism. When one of them steals prey that is too large or heavy to transport, the other members help with the reward of being able to eat the food taken. This cuckoo bee *Nomada fragariae* Mitchell, 1962 (Hymenoptera: Apidae) bird cares for another's nest but raises its young there. The bee that takes its name from the bird acts differently. When it finds the nest of another species, it lays its eggs, and its larvae grow faster than those of the host. Thus, the intruders feed on the other eggs, and the real owner of the place raises the chicks as if they were her own [1-12].

Kleptoparasitism is a case of multiparasitism (is the parasitism of the same host for more of a species of parasitoid in many cases, only one species survives). in which one parasitoid preferentially attacks hosts that are already parasitized. The kleptoparasitoid does not parasitize other species of parasitoids that occurred before it and is normally the one that survives [1-12].

Kleptoparasitism costs time and energy that could otherwise be spent directly on food, so this cost must be offset by the energy benefit gained from the stolen food. Mathematical modeling suggests that when food is abundant, eating together is the best strategy; When food abundance drops below a critical level, kleptoparasitism suddenly becomes advantageous, and aggressive interactions become common. Nutritionally, kleptoparasitic species tend to be adapted to consume the same prey species as the spider host, however, in some cases, the invaders consume, in addition to the prey stored in the web, the oothecae of the host spider and the web itself that is invading [1-12].

A team of Brazilian, Spanish, and German entomologists and botanists (A team of Brazilian, Spanish, and German Entomologists and Botanists (Santos Rojo From the University of Alicante (UA) participated scientists from the Department of Environmental Sciences and Natural Resources of the UA, the Botanical State Collection of Munich, the Institute of Biosciences of the University of São Paulo, from the Alexander Koenig Museum in Bonn and the Illumina Center, San Francisco (USA) found in Brazil larvae of a fly that lives in the sticky leaves of carnivorous plants that steal their food [13].

This fly belongs to the family of Syrphidae (Insecta Diptera) its larvae are "uninvited commensals " of the*Drosera* L.

(Droseraceae) and *Dioneia* Bohemian Garnet (Droseraceae) whose leaves are covered by several tentacles that secrete sticky substances that simulate shiny drops of dew, to attract and capture insects. However, the larvae studied "manage to be immune to the sundew's lethal adhesive and stealing food, technically called kleptoparasitism (Figure 2) [13].

Figure 2. Trap for others: Fly larva of Syrphidae (Insecta Diptera) slides over the tentacles of*Drosera graomogolensis* Silva (Droseraceae) image made in Minas Gerais.

Sources: Image: Paulo Gonella and https://www.bol.uol.com.br/noticias/2016/05/29/cientistas-descobrem-mosca-que-rouba-alimentos-de-plantas-carnivoras.htm.

This is the first time in which a fly can steal prey captured through adhesive secretions from a carnivorous plant that feeds on insects." When they finish their development, these "thieving" larvae move to the underside of the leaves which, instead of Being sticky, it does not pose any danger to the continuation of its biological cycle [13].

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