

13

www.biodiversityjournal.com

ISSN 2039-0394 (Print Edition)
ISSN 2039-0408 (Online Edition)

with the support of



Biodiversity Journal

DECEMBER 2013, 4 (4): 441-584

FOR NATURALISTIC RESEARCH
AND ENVIRONMENTAL STUDIES



Tropidotilla litoralis (Petagna, 1787), Sicily, Italy: male (left), female (right)

The family of Mutillidae (Hymenoptera Aculeata). Velvet ants (Mutillidae) are a family of insects belonging to the order of Hymenoptera and within that to the Vespoidea superfamily of the Aculeata suborder, in which the female ovipositor serves as a sting. Mutillids are known already from Late Cretaceous and Eocene. The family Mutillidae, with about 4200 described species, is among the largest solitary wasp families parasitoids on enclosed hosts at preimaginal stage of other holometabolous insects, but the estimated number of species is much higher. The mutillid faunas of the Palaearctic, Oriental and Afrotropical regions are the most similar on the tribal and generic levels and represent the nucleus of the world fauna. Velvet ants occur in all zoogeographical regions, but the vast majority of them are found in tropical and subtropical regions of the world being abundant in arid and semiarid areas. There are more than 500 species of mutillids in 54 genera known in the Palaearctic region. About 170 species were found in Europe. A peculiar feature for the family is the extreme sexual dimorphism: the males are winged (rarely brachypterous or apterous) and possess a normal apocritan mesosoma. The females are wingless, and appear to be rather setae, colourful ants. They can easily be differentiated from ants by the lack of petiole nodes, which are present on all ant species. In addition, the mesosomatic (thoracic) segments are completely fused and have at most two segments. The metasoma (abdomen) contains six visible terga (dorsal surface of any body segment) and a "felt line" of dense, closely appressed hairs is located laterally on the second metasomatic tergum. Females are generally densely pubescent and predominantly black, brown, or reddish, often marked with bright spots or bands that are usually white, yellow, or red. Because of their extreme sexual dimorphism, sex associations cannot be made on morphological grounds alone; most species and even many genera are known from one sex only. In most cases the males are so different from the females that only males and females caught in the act of copulation can be claimed to belong to the same species with certainty. It may be revealed in many cases that certain male and female specimens thought to be distinct species may belong to the same species, therefore the number of existing species may be lower than the actual number. Knowledge of the natural history of mutillid wasps is usually restricted to the habitat in which the adults are collected and/or the flowers where they are established to feed. Recently it has been estimated that the hosts of only about 2-3 % of the described mutillid species are known, and for some subfamilies there are no records at all. All the species are parasites in the nests of solitary and social bees, wasps, ants or beetles. Females of mutillids are apterous and spend most of the daytime in burrows in ground or under grass turfs. Problems encountered by any female mutillid mainly involve finding suitable host individuals and penetrating their enclosures for egg laying. Solitary hosts are generally scattered and often concealed. Mutillids apparently use odour signals (kairomones) while actively running in suitable locations for finding such hosts, and must spend much time searching, with little prospect of finding numerous hosts. Females search for the ground nests of hosts and deposit their eggs in the brood cells. They usually search for mature larvae (or prepupae) and paralyze the larva with the sting and after that they lay an egg into the brood cell. The mutillid larvae are always ectoparasitoids of host stages which are enclosed in some sort of package (cell, cocoon, puparium, ootheca) and which are not actively feeding. The quantity of accessible food determines the resulting size of the eventual imago. Males are winged and live only a few weeks. They search for virgin females to mate them usually flying not high above the ground. Some mostly tropical species use special dances when males fly and carry females connected on the abdomen within the mating process, otherwise in species living in sand dunes and deserts females carry apterous males on their backs. European mutillids usually have one generation per year (univoltine): both sexes emerge in summer, males die in the beginning of autumn, females overwinter and attack nests of hosts in early or late spring.