

## EVALUATION OF ARTHROPOD FAUNA IN AN URBAN WASTE TREATMENT PLANT

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**Abstract** This study was carried out to determine the composition, distribution and abundance of arthropod fauna of an urban waste treatment plant near Milan, Italy, in order to identify some potential biological control agents for Diptera Muscidae. For five months, from June to October 2004, the arthropod fauna was evaluated by collecting samples from the heaps of fermenting matter, from the middle and the edges of each heap on the surface or at 10, 20, 30 cm depth. During that period, pyrethroid and organophosphate insecticides were applied into the treatment plant to control insect pests like *Musca domestica* (L.) and *Blattella germanica* (L.). The samples (1 kg fresh weight each) were transferred to the laboratory where they were processed in Berlese funnel traps for 3 days. Some samples were incubated in a thermostatic chamber at 25±1°C and 70±10% R.H. in order to pick up the adults emerged (from pupae, larvae and eggs that had completed their life cycle) by hand sorting and visual inspection or water-flotation method.

The arthropod fauna of the urban waste mostly constituted of mites (mainly adults and immature stages of genus *Rhizoglyphus* Claparède, 1869 - Acarina Astigmata: Acaridae) and Psocoptera Liposcelidae, larvae of Diptera Muscidae and Coleoptera. In total, mites excepted, more than 10.000 arthropods, belonging to 7 orders and 17 families, were collected

Among the adult Coleoptera, the families Anthicidae, Staphylinidae, Rhizophagidae, Mycetophagidae and Cleridae (like the red-legged ham beetle *Necrobia rufipes* De Geer) were present. Regarding the Diptera, besides houseflies, some adults of the families Psychodidae, Phoridae, Drosophilidae and Sciaridae were also found. *Xylocoris galactinus* (Fieb.) (Hemiptera: Anthocoridae) a predator of small arthropods, mites and insect eggs and larvae, including young *M. domestica* larvae, was identified among the most common species of this habitat.

The cockroach oothecal parasitoid, *Evania appendigaster* (L.) (Hymenoptera: Evaniidae) was also included in the waste samples. Regarding the hymenopterous parasitoids of synanthropic flies, the following genera were identified: *Nasonia* Ashmead 1904 (Hymenoptera: Pteromalidae), usually employed for the control of housefly, *Pachycrepoideus* Ashmead 1904 (Hymenoptera: Pteromalidae), *Sphegigaster* Spinola 1811 (Hymenoptera: Pteromalidae), *Dendrocerus* Ratzeburg 1852 (Hymenoptera: Megaspilidae) and *Megaspilus* Westwood, 1829 (Hymenoptera: Megaspilidae). The wasps of genus *Pachycrepoideus* are parasitoids of small Diptera of families Drosophilidae, Tephritidae, Muscidae, etc. Most of *Sphegigaster* also are parasitoids of small flies, especially of Agromyzidae, but some species were tested as biological control agents against Muscidae in pilot experiments. Megaspilidae are primary parasitoids of Homoptera, Neuroptera and pupae of various Diptera, or they are hyperparasitoids of Aphididae through Aphidiinae. Despite the insecticidal treatments, the presence of natural enemies indicates that biological control of synanthropic flies in the urban waste treatment plants could be possible.