

Insects in urban and agricultural waste management

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Many modernization processes in contemporary cities have augmented the number of types and the volume of waste material. This necessitated the improvement of the methods used to clean the handling, disposal and production processes associated with the involved waste. The role of insects in these processes is important and well recognized along with yeasts, fungi, and other macroinvertebrates. Insect collectors in the past two-hundred years have observed that the insect yield was richer in terms of individual and species numbers when they collected near solid waste piles. It is well known that many insect species in the orders Diptera (flies), Hymenoptera (wasps, bees, and ants) and Coleoptera (beetles) are saprophagous, detritivorous, plant tissue eaters, saproxylics, or carrion scavengers and they live on and lay eggs in the pile of waste. For all these properties insects constitute an appropriate alternative to waste treatment as effective decomposers and recyclers of any sort of organic matter. The last property is already used in the treatment of swine, poultry, and cattle manure imitating the provided ecosystem service by natural communities. In these applications the existence of pests capable in vectoring human pathogens should be excluded by spraying the pile of waste with some form of insecticide, usually invented for other purposes the juvenile analog insecticide pyreproxifen used in crop protection, and the entomopathogenic microorganisms *Beauveria bassiana* and *Bacillus thuringiensis*.

Another important aspect of the role of insects comes from the experience of entomologists in field collection. As a rule, the collection from waste disposal sites where richer than the samples coming from nearby more or less natural ecosystems. According to the origin of waste the dominant group can be Diptera for urban waste, or Coleoptera at later stages after several weeks, Coleoptera and invasive forest insects for wood sawmills, Diptera species (Muscidae, Syrphidae, Drosophilidae, Scatopsidae, *Musca* spp., *Stomoxys* spp.) for urban and agricultural waste (domestic animal manure composters like *Hermetia illucens*), rare and characterized as endangered by IUCN insect species in woodsheds and arboretums (Cerambycidae e.g. *Morimus funereus*) . This increases the biodiversity and its quality in otherwise severely degraded ecosystems, and increases the local population densities of endangered species which are on the brink of local extinction. In the talk several types of ecosystems are presented together with the insect content of nearby waste piles and litter bins. The possibility to have disease incidences –or recovery from pests– from invasive insects in these places is also discussed and evidenced in Greek urban and natural ecosystems.