

In tropical countries, organic waste can be turned into compost quicker by using maggots

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The black soldier fly is a veritable eating machine – at least in its larval stage. Despite its rather martial name, it's not an insect that would ever do anyone any harm. Its larvae feed on rotting organic material such as food scraps or dung. "They can reduce most of just about any type of organic waste in a short space of time", says Noah Adamtey from the Research Institute of Organic Agriculture (FiBL) in Frick.

Adamtey is running the scientific section of a project that aims to employ the appetite of soldier fly larvae (*Hermetia illucens*) in developing countries. It is being implemented in the greater metropolitan area of Accra, the capital city of Ghana. "Just as in other big cities in tropical regions, composting is poor in Accra", says Adamtey. On the one hand this leads to immense hygiene problems because organic waste makes up more than half of the total refuse in developing countries. On the other hand, it's also a waste of natural resources – because while the rapidly increasing population is dependent on productive agriculture, the soil is exhausted and not very fertile.

Feed for fish, chickens and songbirds

This is why, in collaboration with Ghanaian colleagues in Accra, researchers at FiBL want to make composting worthwhile for the local population. To do this, organic waste is fed to tiny soldier fly maggots. Because they chew up the waste in record time, says Adamtey,

composting time is reduced by roughly a third to less than 80 days. Farmers can then use the valuable compost in their fields. An additional goal of the project is to provide a further use for the maggots of the soldier fly – as feed for fish farmers, who find it difficult to meet the Ghanaian population's appetite for fish. "The larvae are an extremely interesting source of [animal feed](#) when you consider their protein and fat content, plus their amino acid profile", says Adamtey.

Stefan Diener agrees – he's studying the waste recycling properties of the black soldier fly at the Swiss Federal Institute of Aquatic Science and Technology (Eawag) in Dübendorf. For example, he sees potential in selling dried larvae to chicken breeders in Uganda, who traditionally mix their feed themselves. An Eawag project in Indonesia is also planned that will sell the living larvae to local songbird owners.

The most important aspect of such projects is to provide value to organic waste in developing countries, says Diener. "If the waste can't be used profitably, then huge mountains of garbage lie around and turn into a massive, stinking problem". But it depends on local conditions whether or not the soldier fly is the best solution. "If the energy demand in a region is very high, biogas could be more profitable, for example". The organic waste would then be turned primarily into methane.

When larvae chew on scrap metal

You also have to make precise checks as to what the pitfalls might be in individual cases, says Diener. Because soldier fly composting means you have to produce fly eggs continually on the spot and have a rational separation process to separate the mature maggots from the compost. "And you have to be certain that the customers buying the larvae will accept animal feed that's been produced from waste". If these conditions can be met, then the soldier fly has great potential.

This is the case in Accra, where Adamtey says the FiBL project is on track. The basic biological checks have meanwhile been completed, he says, and guidelines for the local population are being drawn up to inform them how to make compost with soldier flies. One problem remains, however; in Ghana, [organic waste](#) is often not separated from inorganic waste. This makes composting more difficult. Because when they eat plastic, glass or electronics, the larvae of the black soldier flies ruin their mouths.

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