Weaver Ants Convert Pest Insects Into Food Prospects for the Rural Poor

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Weaver ants killing a cricket

Weaver ant (*Oecophylla smaragdina)*

Harvested ant larvae ready for the market

Weaver ants from the genus *Oecophylla* can benefit tropical farmers in two ways. The ants control pest insects and are themselves a valuable food.

Biocontrol The ants attack and prey on insects and can protect 12 plantation crops against 50 different insect pests throughout the old world tropics - in many cases more efficiently than chemical pesticides (Van Mele 2008). They are being implemented as pest control agents in an increasing number of countries in Asia, Africa and Australia.

Commercial mango plantation in Northern Australia protected by weaver ants. As the ants build their nests in the canopies trees are connected with lines to facilitate ant colonisation

Ant harvest Insects as food is widespread in the tropics and is an important source of protein, vitamins and minerals. Weaver ants are a priced food in several countries in both Asia and Africa. The Thais consider these ants a delicacy, harvest them in vast amounts and even export them to Europe (Sribandit et al 2008). As the ants are high in protein (48.5% in dry mass), ant harvest benefit both rural economy and nutrition.

Thai women harvesting weaver ants from a mango tree. Two persons can harvest 4-5 kg ant larvae per day

Integrating ant biocontrol and ant harvest is sustainable (Offenberg & Wiwatwitaya 2009). In a Thai mango plantation ant larvae were harvested without reducing worker ant densities and thus without detrimental effects on their ability to control pest insects (Fig. 1).

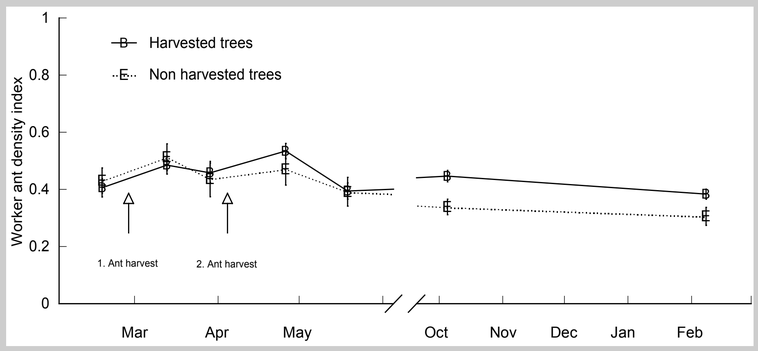

Figure 1. Worker ant densities by time on mango trees in a plantation in North Eastern Thailand. The figure shows the mean densities (SE) for trees where ant brood were harvested and trees where ant brood were not harvested ($N_{harvested}$ = 52 trees, $N_{unharvested}$ = 18 trees). Arrows indicate the times of harvesting on 27 Feb and 2 Apr 2007. From Offenberg & Wiwatwitaya 2009.

Harvestable ant biomass ranged from 114 to 377 g fresh weight tree^{-1} year^{-1}, if ants were unmanaged and if ants were fed sugar and protein, respectively.

Thus, weaver ants may lead to higher and sustainable fruit production and provide high protein food.

Distributions Weaver ants cover the Old World tropics (Cole & Jones 1948) and envelop the majority of countries having the highest rates of chronic hunger (FAO 2002)(Fig. 2). In the same part of the world insect eating is widespread (Defoliart 1999).

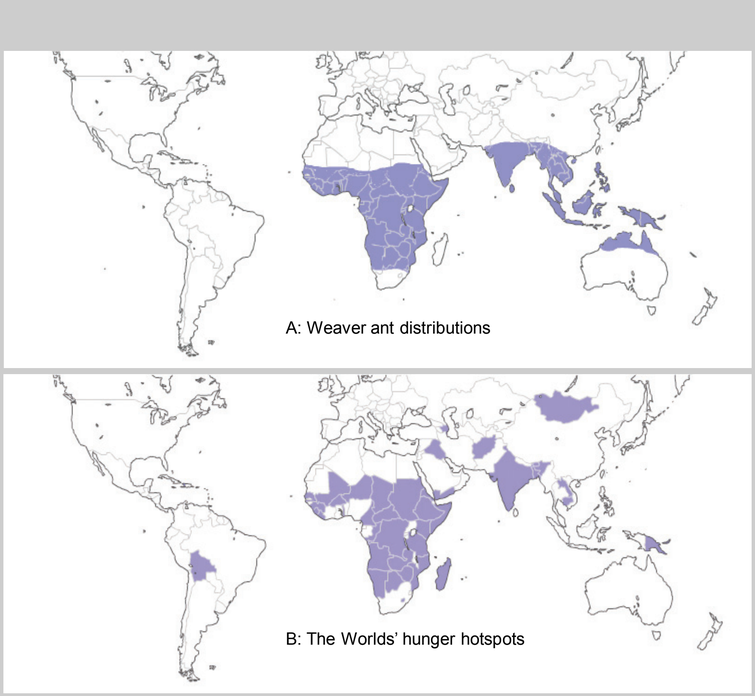

Figure 2. (A) The geographical distribution of weaver ants (*O. Longinoda* in Africa and *O. smaragdina* in Asia/Australia). (B) The distribution of countries having the highest rates of chronic hunger (FAO 2002).

Protein yields With 278 trees one hectare produce from 32 to 105 kg ant biomass. WHO (2003) estimates that sub-Sahara African meat consumption average 9.4 kg capita^{-1} year^{-1}. Thus, without investment (no ant feeding) the ant "meat" produced by one hectare plantation can more than double three peoples' intake in this region.

Implementing the use of weaver ants among the rural poor may be eased by the fact that the technology is readily available and "low tech" - the ants are native and require no external input but knowledge.

Conclusion The ants turn harmful pest insects into edible protein with sustainable increased fruit production as a spin off. One problem – pest insects – is turned into the solution of another – protein shortage.

We suggest this method as an easy low-cost action towards increased food production in tropical smallholder plantations.

The net and bamboo stick used to harvest ant nests

References

Cole AC & Jones JW 1948. American Midland Naturalist 39: 641-651

DeFoliart GR 1999. Annual Review of Entomology 44: 21–50

FAO 2002. The state of food insecurity in the world. Rome Italy.

Offenberg J & Wiwatwitaya D 2009. Asian Myrmecology, in press.

Sribandit W Wiwatwitaya D Suksard S & Offenberg J 2008. Asian Myrmecology 2: 129-138

Van Mele P 2008. Agricultural and Forest Entomology 10: 13-22

WHO 2003. Diet, nutrition and the prevention of chronic diseases. WHO technical report series 916. Geneva.