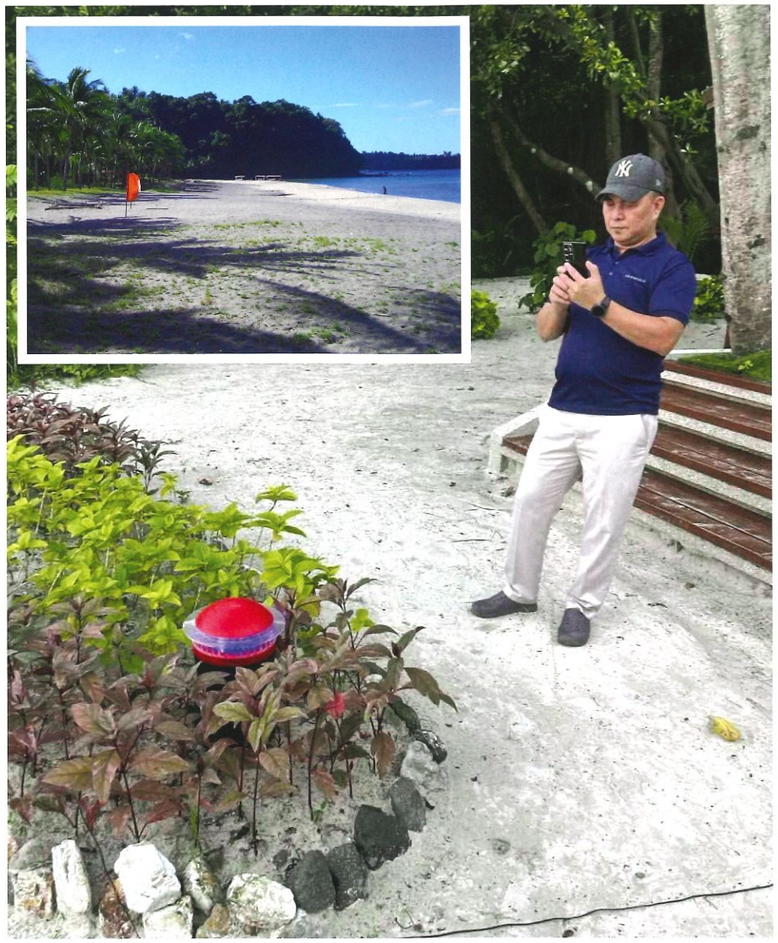
Growing nuisance from sandflies on Philippine islands

Dr Partho Dhang*



Light-based sandfly trap being tested outdoors.
Inset: wet beach sand often acts as a breeding ground for sandflies in S E Asia.

Several Philippine islands, all known for their exotic location and beauty, have reported sandfly problems. This severely affects the island's tourism and visitor welfare.

Sandflies are small blood sucking flies. They are important as vectors of a disease called leishmaniasis. Leishmaniasis is transmitted by the bite of infected female sandflies belonging to the species *Phlebotomine*. This species can transmit the protozoa *Leishmania*, the disease-causing organism to humans. The disease has different forms. The cutaneous form manifests with skin ulcers, while the mucocutaneous form leads to ulcers of the skin, mouth, and nose, and the visceral form starts with skin ulcers and then later presents with fever, low red blood cells, and enlarged spleen and liver.

* Belarmino Street, Makati City, Philippines

Species that occur in the Mediterranean region can spread sand-fly fever, a viral disease also known as "Pappataci fever" or "Three-day fever".

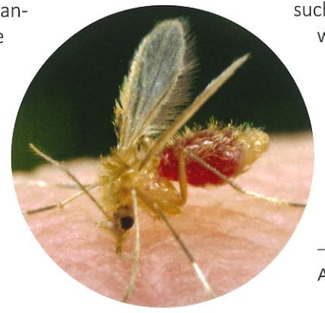
Sandflies are an occasional pest notable in some parts of Asia. They are mostly reported from rural, semi urban and seashores. They deposit their eggs in humid places on damp soil or wet sand rich in humus or manure. The larvae feed on decaying organic matter.

Examples of suitable breeding sites are small cracks and holes in the ground, the ventilation shafts of termite hills, animal burrows, cracks in mud walls and masonry, tree roots and shaded sandy beaches etc. Large populations of sandflies can build up in areas like cattle sheds and animal farms. The cattle can provide an abundant source of blood while the stables and houses provide suitable resting places. The life cycle may last from 1 to 4 months depending on the climate of the region.

Behaviour

The adult sandflies are weak fliers and usually stay within a few hundred metres of their breeding places. They move in a characteristic hopping style, with many short flights and landings. Most biting occurs outdoors but a few species also feed indoors. Most species are active at dawn and dusk and during the night, but in forests and indoors they may also attack in daytime, especially if disturbed by human activities.

Sandflies feed on plant juice. Females need blood-meals to develop eggs. Blood is taken from humans, animals such as dogs, farm livestock, wild rodents, snakes, lizards and birds. Each sandfly species has specific preferences for its source of blood, but the availability of hosts is an important factor. The saliva of sandflies can enhance the virulence of inoculated *Leishmania* parasites.



A sandfly feeding.

Control and Management

Personal protection against sand fly bites

The recommendations given out by CDC (2013) as preventive measures when travelling to infested areas are as follows under outdoor conditions:

- Minimise the amount of exposed (uncovered) skin. To the extent that is tolerable in the climate, wear long-sleeved shirts, long pants, and socks; and tuck your shirt into your pants. (See below about wearing insecticide-treated clothing.)
- Apply insect repellent to exposed skin and under the ends of sleeves and pant legs. Follow the instructions on the label of the repellent. The most effective repellents generally are those that contain the chemical DEET.

Under indoor conditions the following are recommended:

- Staying in well-screened or air-conditioned areas.
- Keeping in mind that sand flies are much smaller than mosquitoes and therefore can get through smaller holes.
- Spraying living/sleeping areas with an insecticide to kill insects.
- Using bed nets. If possible, use a bed net that has been soaked in or sprayed with a pyrethroid-containing insecticide. The same treatment can be applied to screens, curtains, sheets, and clothing (clothing should be retreated after five washings).

Recommended methods of control

Environmental control efforts: These are the best way to check breeding and harbourage. Removing moist soil, organic matter, animal wastes and other suspected items from the vicinity is a must.

Insecticide application: Control of sand flies is often difficult because methods mainly rely on interrupting contact between female flies and humans. Both chemical and environmental controls are the best method to control populations of sand flies. The main chemical control methods have been indoor residual spraying with organophosphates (malathion), carbamates (propoxur), and synthetic pyrethroids (permethrin and deltamethrin). Chemical control may have challenges if the fly population has developed resistance. Combination of a number of actives and chemical rotation is thus recommended.

Bait application: Use of a product called "Attractive toxic sugar baits (ATSB) have shown success in controlling sand fly populations. This product is applied in patches of vegetation and barrier fences in areas lacking vegetation that could be sprayed. This method has been successful because both male and female sand flies, like other biting flies, require sugar from plants and sometimes honeydew for survival.

Traps: Recently a light-based trap has been developed by Florida Insect Control Group (FICG) which is designed to capture adult sandflies. The trap emits blue and UV light of a selective wavelength to attract the pests into it, which are then trapped in a net bag. Trials of the device are currently on-going. ■

The light-based sandfly trap

All photos by the author