

Herbal extract for the control of fruit flies

Fruit flies [*Bactrocera dorsalis* (Hendel) and *Bactrocera correcta* (Bezzi)] are considered as a major pests causing damage to a wide variety of fruits such as rose apple, guava, mango, wood apple, jujube, banana, papaya, custard apple, orange, rambutan, longan, lychee, jack fruit, pomegranate, coffee bean, and grape. The female fly pierces its egg-laying organ into the fruit peel and lays eggs in the fruit. Worms grow from the eggs and eat the fruit which rots and falls from the branch, thus, on a wide scale, causes great economic losses.

Most farmers protect their fruits by covering them with paper or plastic bags. This works when there are only a few fruit trees, but in the case of large orchards covering 10-100 rai (1 rai = 1,600 m²), it is impossible to cover all the fruits as this will require lots of labor, materials and time. On the other hand, if farmers opt for chemicals to kill the flies, their produce will be stained and often will render hazardous for human consumption.

A simple and safe technology has been developed to protect various fruits from the flies known as herbal extract (Fig. 1). The technology is economical and safe both to farmers and consumers, and considerably improves fruit quality.

Galingale

Galingale (Fig. 2) is a herbal tuber that effectively repels various pests and flies. Galingale, known by its scientific name *Alpinia galangal* Swartz of the

Zingiberaceae family, is a short-cycle tuber, with a light yellow flesh, 1.5-2 m tall, with nodes and internodes.

Galingale extract makes an effective pesticide. A study shows that galingale extract can provide 99.21 percent protection to fruit from flies laying eggs, and an experiment in a paddy field shows that brown spots on paddy leaves are also eliminated.

A significant substance in galingale is called galagin, or galangol, which has 0.5-5 percent fragrant oil, or aerid resin. This fragrant oil is used to treat excess gas or bacteria in the stomach for humans, while for plants galingale extract in alcohol can protect the fruit from fungi.

Extracting techniques

Grind old galingale tubers (Fig. 3) and ferment the mass in clean water. Put the ground galingale in a container, press it with your palm and then add water. Allow it to ferment overnight then filter the extract in the morning. Blend the fermented liquids without galingale scraps with clean water at a ratio of 1:10 (1 liter fermented liquid to 10 liters clean water for 10 fruit trees). Spray the fermented extract once in 3 days on fruit the size of a match; once in 5 days on fruit the size of a thumb; or once in 7-10 days on a rose apple or fruit a bit larger than your thumb. The fermented extract will provide the fruit with 70 percent protection from flies.

A drawback is that the fermented extract develops a foul odor after 2 days.



Fig. 1. Farmer making herbal extract.



Fig. 2. Galingale.

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Preserving the galingale extract

To keep the galingale extract for a longer period, ferment it in 95 percent ethyl alcohol instead of clean water. The extract can then be kept for months, or even years. In addition, its fly-prevention efficiency is increased to 90 percent.

- ❑ Chop and grind old galingale. Ferment in a ratio of 3:1:1:1/4 galingale: 95 percent ethyl alcohol: clean water: soap liquid. The soap liquid helps the galingale extract to adhere to the fruit or leaves, and is not easily washed away by rainwater.
- ❑ Application: Blend 50-70 cc (3-5 tablespoons) of extract with 20 liters of water (Fig. 4) and spray it on young fruit (Fig. 5) once every 7-10 days until fruit flies are unable to attack them. Its efficiency is about 90 percent and by fermenting the extract in ethyl alcohol, it can be kept much longer than fermenting in water.



Fig. 3. Chop and grind the old galingale.



Fig. 4. Blend 50-70 cc of extract with 20 liters of water.

Distilled galingale

Another extraction technique is distillation, similar to the production of liquor, or perfume essence, using the distillation process.

- ❑ Boil the herb with clean water in a container with a coil at the bottom to allow steam through a vessel filled with water at normal temperature.
- ❑ As the steam meets the cool surface, surrounded by the water, it will condense into 100 percent pure extract. This distilled toxin can protect fruit from flies and kill pests. Its efficiency is 90 percent and it can be kept for years.

A drawback is the relatively high investment required for the distillation equipment. However, its worth it in the long term. Application rate is similar to the extract fermented in 95 percent ethyl alcohol: a blend of 50-70 cc (3-5 tablespoons) of extract with 20 liters of water is used to spray on young fruit once every 7-10 days until harvest time.



Fig. 5. Spray the extract on young fruit.