

The Bell Cricket at Work

- "The Ant and the Chirping Insect", a revised Aesop's fable -

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“The Ant and the Grasshopper”, the famous Aesop's fable, describes how the grasshopper spends the whole summer loitering away, chirping songs, enjoying himself, without working diligently to collect and store food. Contrariwise, the ant spends all her time to search and stock up food for lean time. When winter comes, the grasshopper is no longer able to find food and becomes so hungry that he begs the ant for food. Giving this lesson for many years, the fable has fostered an impression that the ant works very hard and the grasshopper is a sluggard. In actuality the ant collects food earnestly. However, there has been no clear indication that the chirping insect like the grasshopper does not work diligently. In the present study we have employed *Meloimorpha japonica*, another chirping insect species, and our observations here have raised an unforeseen possibility that the bell cricket may behave as a sedulous worker, unlike the “idle grasshopper” in the Aesop's Fable.

1. INTRODUCTION

The Aesop's fables are collections of excellent tales with uncountable readers throughout the world, east and west, modern and ancient, and young and old. The work was originated by a Greek storyteller Aesop (or Aisopos) lived in 6th to 5th centuries BC and comprises as many as 300 to 400 stories¹⁾. However, it is unlikely that they are all attributed to Aesop himself, as quite a few pieces were included after Aesop. Long time beyond medieval Europe with Latin resources and the Renaissance with Greek resources the collections were continuously rearranged to include new pieces and organize the tales by Aesop and those by other sources. One of the most notable characteristics of this literature is that its fables make use of plain and modest incidents, yet they are ingeniously instructive and rich of moral lessons. After many centuries of cultural incubation, Aesop's fables have been evaluated highly, hence, there has been a tendency for its stories to be regarded to reflect the truth.

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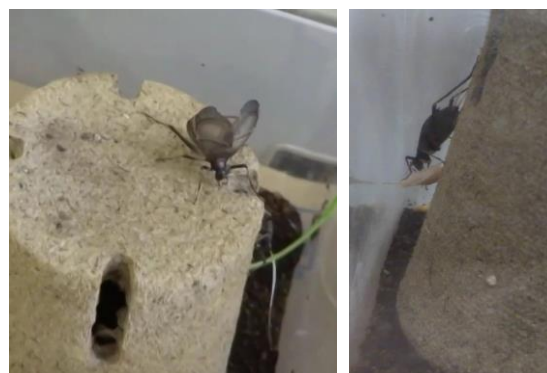


Fig. 1 The bell cricket chirping and grabbing food up the pot.

Let us see a familiar fable “The Ant and the Grasshopper.” (Number 373 in the Perry Index)^{2,3)}. It describes that the grasshopper kept singing throughout the whole summer (Fig. 1), while the ant worked assiduously during summer to collect food in preparation for the coming winter (Fig. 2). When winter came, the Grasshopper had no food to eat. It begged the ant but was refused. The moral lesson here is that one should work diligently and save up for times of stress.

In this fable, originally in the ancient Greece, the cicada was used in place of the grasshopper. When the fable was propagated to the north Europe around 12th to 15th centuries, the cicada unfamiliar in the north areas tended to be replaced by other insect

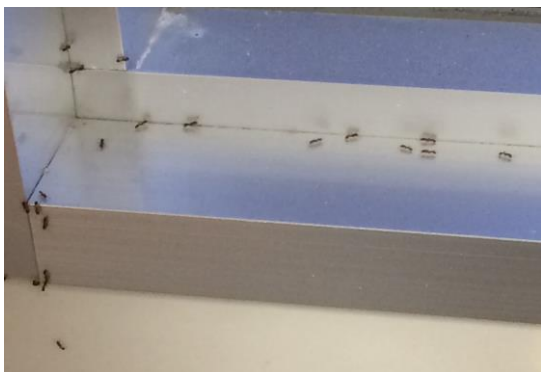


Fig. 2 The ants at work (*Tetramorium Tsushima*).

species, such as cricket or grasshopper. In any event, as this tale has been so renowned and there has been so many years ever since, it is little wonder that the public has come to think that the chirping insects spend life time without working diligently. However, it has yet to be shown clearly that they are idle creatures. Here, we would like to report some interesting observations on the behavior of the bell cricket, another chirping insect species.

2. MATERIALS

For the present study we used the bell cricket *Meloimorpha japonica* (or *Homoeogryllus japonicus*), which is a popular chirping insect, famous for its pellucid sound like tinkle of a bell, hence the name "bell cricket" or "bell-ring cricket" (Fig. 3)⁴. This belongs to Orthoptera and Ensifera like the grasshopper but to different taxonomical families from grasshoppers or crickets. In general terms, both male and female grasshoppers chirp⁵, whereas only adult male bell cricket does chirp, seeking for a mate⁶. Now, we are set out to see whether the bell crickets "just do chirping and playing without doing work to store food," like that grasshopper in the Fable.



Fig. 3 The male adults busy in chirping.

3. INSECT REARING

We kept 20-30 adults in a cage, about the size of 8-10 liter-large (total 6 cages). They were fed with powdered insect food, water and some vegetables. For physical and mental health of these little residents, we also installed Jiffy pots or paper cups as their nest and hideaway. Additionally, oat grains were seeded so that the grass grew (Fig. 4).



Fig. 4 Jiffy pots and oat seeds in the cage.

4. OAT GRAINS SCATTERED

Occasionally, we noticed that the seeds were moved and scattered a few days after they were put in the cage (Fig. 5). This



Fig. 5 Top: oat seeds were put in the corners; bottom: a few days later, the grains were scattered.

must be done by the bell crickets, the sole residents living there. By constantly watching these insects, we actually did observe on a few occasions that they carried and moved the seeds (Fig. 6). But we were wondering for what purpose they did so. (Those

To further confirm such the incident, we tried a different type of bait. Ordinarily the bell crickets were fed with ground, powdered food, which they can eat there on the spot and therefore, do not need to carry. Then, what if they are given something larger?



Fig. 6 Grabbing and carrying an oat seed.

results are shown in "Table" at the end of the text.

5. CARRYING FOOD



Fig. 7 A male got a pellet, a female filched it.

If they do possess some behavior trait of storing away food for hiding or future use, they would try hard to work on these baits. We first tested the use of pelleted cat food as bait. The body weight of an adult bell cricket in the cages was in the range of 0.15 - 0.57 g (♂ 0.15~0.23 g; ♀ 0.22~0.57 g), whereas a pellet

of cat food weighed 0.15 - 0.27 g and an oat grain 0.037 - 0.041 g. So, the bait used here was substantially heavy for the cricket. Incidentally, the ant is known to be capable of carrying more than 10 times its body weight^{7,8)}. For example, an adult of *Formica japonica*, a common ant species in Japan, weighs about 2.1 - 4.0 mg can carry and lift a weight of more than 40 mg.

So, here is what we observed after we put cat food pellets inside the cage: The bell crickets, either male or female, approached the bait, licked several times, then tried to move,



Fig. 8 Carrying food.

drag and carry the pellet (Fig. 7). Some insects climbed the pot, holding pellet like a food cake in the mouth (Fig. 8; Fig.1 right).

In another instance, they did stow cat food in the pot (Fig. 9). Furthermore, we found that the oat grains were hidden in their “nest” (Fig. 10, Fig. 11). Do they store food? We are curious about their business.



Fig. 9 Securing food in the nest.



Fig. 10 Collected grains: the right pot is temporarily removed to show the grains inside.



Fig. 11 Collected grains: the pot is temporarily removed to show the grains inside.

Table: Actions of the bell crickets moving food

Observed incidents	Date	Time of day	Frequency	Frequency (♂)	Frequency (♀)
Scattering oat grains	2020 Jun-Aug		7		
	2021 Jun-Aug		23		
Carrying oat grains	2020 Aug	14-18	3		3
	2021 May-Jul	14-17	6	1	5
Carrying cat food cakes	2020 Aug	10-18	31	7	24
Bringing food into the nest	2020 Aug	13-18	2		2
	2021 Jul	14	1	1	

Adult bell crickets were fed with powdered food constantly. For the experiment they received additional baits (oat grains and cat food pellets). The body weight of ♂ was 0.15-0.23 g and that of ♀ 0.22-0.57 g. "Time of day" is in the 24-hour system.

6. COMMENTS

Apparently, the bell cricket did carry and move around not only oat seeds but also much larger, heavier cat food pellets. Even more, we could witness their action hiding the food in the nest, by some chance, for storage. The possibility has been raised now that the chirping bell cricket may behave like a sedulous worker, unlike the idle grasshopper as described in the

Aesop's Fable.

Incidentally, only the male bell cricket chirps⁶⁾. Although the fable gives one an inkling of singing and dancing people's idleness, our observations here have shown that the chirper also works in spite of its smaller body than the female (Table). That is to say, "you can't judge people by their appearance."

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