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Parasite 'hitch hikers' hit Ord rice pest

by S. E. Learmonth*

The white rice stem-borer *Tryporyza innotata* is a serious pest of rice in the Ord Irrigation Area. Larvae of this moth feed inside the rice tillers and eventually kill them. A 'dead heart' in young growing rice and a white empty head at the reproductive stage are among the symptoms.

Rice is grown during both the wet (Dec-Apr) and dry (May-Nov) seasons on the Ord, but only the wet season crop is seriously affected. The stem borers undergo a resting stage as larvae in the soil during the dry season. When the wet season rains start, the larvae complete their development to emerge as moths which mate and lay their eggs in rice crops. At this stage, the egg parasites attack.

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As part of the research undertaken to control this pest, entomologists have conducted studies into the effects of its natural biological control agents. They have found three species of egg parasite in the area. One in particular, *Telenomus rowani*, is by far the most abundant. As expected with a pest such as the stem borer which has a resting stage, *Telenomus* is present in low numbers at first, but becomes more abundant later in the crop cycle (see Table 1).

The stem borer in commercial rice can be controlled through the use of granular insecticides which act by being taken into the plant, and also by capillary action of water between the leaf and stem. In this way, the egg parasites remain alive in the crop, whereas if liquid insecticide sprays are applied, they can kill the small wasps.

*The rice stem borer moth.*

*A Ord River rice trial.*

*Rice damaged by the pest.*
When such liquid sprays are used sometimes to control a grain sucking pest of rice, they are applied only after head emergence. At this time new infestations of stem-borer are unable to damage plants and the egg parasites are therefore no longer required in the crop. Even so, only low rates of selective insecticides (as opposed to broad-spectrum insecticides which are harmful to beneficial insects) are used to control this grain sucking insect.

It is interesting to note the habit of *Telenomus*, which ‘hitches a ride’ on the stem-borer moth. Up to three wasps have been seen on one moth. This habit has obvious advantages in achieving high parasitism rates—the wasps do not even have to search for their host eggs.

A major factor which limits *Telenomus*’ ability to effectively prevent the white rice stem-borer causing economic damage is the seasonality of the pest. A logical step to increase the effectiveness of the egg parasite is to artificially mass rear and release large numbers of the wasps in January to coincide with the flight of moths. Rice has the ability to compensate for early tiller death, so the crop can tolerate infestations of stem-borer before the parasite numbers build up significantly.

The main obstacle to testing the above proposal is that *Telenomus* appears to have a narrow host range, and the rice stem-borer (the only host found to date) is all but impossible to rear in the laboratory.

Research designed to examine potential hosts on which *Telenomus* may be mass-reared will be conducted as the first step in assessing the possibility of achieving control of the pest with its naturally-occurring biological control agent.

![Left: Borer larvae inside a rice stem.](image1)

![The hitchhiker' rides to parasitise the eggs.](image2)

| Table 1. Level of egg parasitism by Telenomus wasps of white rice stem-borer eggs. |
|---------------------------------------------|---|---|---|---|---|---|
| Time of collection | Dec | Jan | Feb | Mar | Apr | Av% |
| Year | No. eggs collected | Parasitism % | No. eggs collected | Parasitism % | No. eggs collected | Parasitism % | No. eggs collected | Parasitism % |
| 1978 | 5141 1628 600 | 43 57 94 | 353 | 0 0 15 | 2687 245 30 | 12 51 0 | 1244 | 80 | 65 |
| 1979 | 606 706 — | 61 57 | 447 | 2782 836 3014 | 31 20 36 71 | 55 67 80 55 71 | 82 0 | 45 |
| 1980 | 353 | 643 438 | 1248 | 536 10602 8010 816 | 37 45 25 79 | 100 | 35 | |
