

# Male Bugs Sponge Off Their Mates

## Females' gland secretions keep piggybacking males well fed

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Female water bugs provision their piggybacking mates.

Throughout the animal kingdom males court their mates with offerings of food and other temptations. But in a newly discovered insect, the roles are reversed. Among water bugs, females take full responsibility for providing their mate's meals, particularly during the mating season.

In other insects that practice gift exchange, the male provides the equivalent of Valentine's Day dinner: tasty, nutritious morsels that energize the female and make her look favorably upon her suitor. In some instances, the gift keeps her from trying to chow down on her mate. Other gifts contain chemicals that are toxic to potential enemies and help protect the eggs. But after seeing males riding piggyback on female water bugs--which look and act like water striders--evolutionary biologist Göran Arnqvist of the University of Uppsala, Sweden, decided to find out if she was doing the giving. He and colleagues Therésa Jones and Mark Elgar of the

University of Melbourne, Australia, took a closer look.

Arnqvist observed that females have an unusual gland on their backs--right where the male's head is positioned as it hangs on. To find out whether the female was rewarding her companion with food through glandular secretions, the researchers fed radiolabeled fruit flies to the females. They followed the meal's radioactive signal from female to male, showing that the males were indeed feeding off of the females, Arnqvist's team reports in the 24 July issue of *Nature*. Her generosity could have evolved as a way to keep males from eating her, Arnqvist suggests. The cost to the female is quite low, as they produce as many eggs with or without a male on her back. For the male, this lifestyle is a boon: Those getting a ride double their life span.

The experiment "shows a direct transfer of nutrients to the male," says Edward Morrow of the University of California, Santa Barbara. "It's the first example I know of" of this behavior.