

Bioluminescence and behaviour of glow-worms

David Merritt

Abstract

In 1967 Ian Stringer published an article describing the behaviour of New Zealand glow-worms in their snares based on painstaking observations taken through the night. Using *Arachnocampa flava*, the glow-worm from south-east Queensland, Australia, I confirm and extend these observations using time-lapse video. Glow-worms were taken from rainforest sites and maintained in the laboratory on an artificial substrate that allows larvae to withdraw into a crevice during the day. Their nocturnal behaviour was recorded using time-lapse digital photography under near infra-red (nIR) illumination, invisible to glow-worms and humans, but detectable by a nIR-sensitive camera. Larvae are generally very active in their snares, interspersing bouts of snare maintenance activity with periods when they are stationary and glowing. To produce new fishing lines the larva hangs from the tubular gallery and lowers a silk line, periodically adding droplets to the line. There is a high turnover of fishing lines, the glow-worms removing and replacing many lines each night. Artificial removal of all fishing lines leads to substantial replacement within one night. Contrary to the observations of others, fishing lines are not re-attended and lengthened once they have been produced, and they are not moved to different positions. Production of fishing lines and the placement of sticky droplets is a very stereotyped behaviour that may reveal species-specific or habitat-specific characters.