

# THESIS

Strategy for Compensating Imperfect Host Discrimination in an  
Infanticidal parasitoid, *Haplogonatopus atratus*  
(Hymenoptera: Dryinidae)

子殺しをおこなう寄生蜂クロハラカマバチにおける  
不完全な寄主識別を補完するための戦略

A Research Thesis Submitted in Partial Fulfillment of the Requirement for  
Master's Degree in Science Majoring in Integrated Food Production  
and Management Planning



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GRADUATE SCHOOL OF AGRICULTURE  
SRIWIJAYA UNIVERSITY

2015

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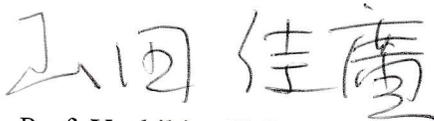
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## APPROVAL PAGE

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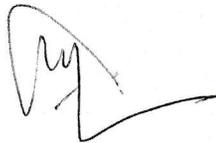


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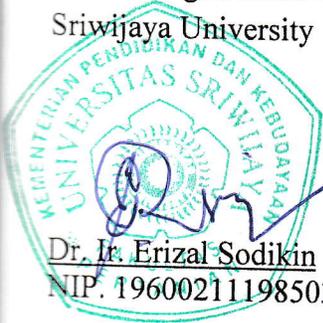
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I swear that all information regarding data collection and results contained in this thesis originated from my own work under guidance of my research supervisors except where it is cited as from published works. If in the instance that I am found to have committed plagiarism in certain part of this thesis, I am willing to face any penalty imposed by the University of Sriwijaya. I make this statement from my own conscious mind and not from coerced by any party.



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## SUMMARY

The female of *H. atratus* lays an egg into the host abdomen on the side that is determined when she grasps the host (left or right). The immature parasitoid remains at the oviposition place. When performing superparasitism, the female parasitoid often probes the non-oviposition side as well as the oviposition side before laying an egg to kill the first progeny with her sting. The probing of the non-oviposition side (called infanticidal probing hereafter) often occurs even when attacking unparasitized hosts. Such action is seemingly maladaptive. However, if the ability for host discrimination is imperfect, the action appears to be adaptive: the female parasitoid is expected to perform the infanticidal probing based on some cues suggesting that a target host is more likely to be parasitized. If non-oviposition probing incurs some cost, the following factors are expected to induce non-oviposition probing: (1) Older instars: the parasitoid is koinobiont species, and so older-instar hosts are more likely to be parasitized. (2) Larger parasitoids: the cost for non-oviposition probing appears to be relatively smaller for larger female parasitoids. (3) Encountering of a parasitized host: it informs the female parasitoid of a higher level of parasitism among hosts around her. These predictions are verified by conducting experiments in the laboratory. Host instar had significant influences as expected above, but the parasitoid size did not, which suggests that the cost for the infanticidal probing is independent of the parasitoid size. Encounter of a parasitized host increased the infanticidal-probing frequency when unparasitized hosts are in the fourth instar and the frequency of the infanticidal-probing frequency was <80% in the pre-experience period. Moreover, when fifth-instar hosts were provided, the probing frequency decreased after encountering an unparasitized host, but not after encountering a parasitized host. The same is true with the repetition number of probing per oviposition with probing when fourth-instar hosts were provided. This suggests that continuous ovipositions of fourth or fifth hosts are costly, and that the presence of a parasitized host is a cue for inducing infanticidal probing.

*Keywords: infanticidal parasitoid, dryinidae, parasitization*

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