Caste Morphology and Development in *Termitogeton* nr. *planus* (Insecta, Isoptera, Rhinotermitidae)

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Running headline: CASTE MORPHOLOGY AND DEVELOPMENT IN *TERMITOGETON*

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**ABSTRACT** The termite family Rhinotermitidae displays a wide diversity in its patterns of social organization in castes. The genus *Termitogeton* probably branched off early in the evolution of this family. We studied the developmental pathways of a putative undescribed species from New Guinea, *Termitogeton nr planus*. The development begins with two white inactive instars (larvae), the second of which possesses small wing buds. These are followed by a relatively homogenous group of active immature stages (pseudergates) among which a biometric study revealed the presence of four instars. The first of these instars possesses wing buds that regress at subsequent molts. The external morphology of older instars resembles that of higher termite workers. Older pseudergates can differentiate into presoldiers and then into soldiers, but they are also able to molt into a unique stage with long wing pads (nymph), preceding the imago. Colony maturity can be reached with about $10^3$ individuals. The sex ratio is near 1:1 in all castes except soldiers, among which females are more numerous than males. The caste pattern of *T.*, *nr. planus* is reminiscent of those of the Kalotermitidae and Termopsidae, and of *Prorhinotermes* among the Rhinotermitidae. None of these taxa possess a true worker caste, permanently diverted from imaginal development: social tasks are done by unspecialized immatures that retain a full array of developmental options, including that of proceeding to the imago. The most remarkable trait of *T.*, *nr. planus* is the presence, in all second-instar individuals, of wing buds that later regress to reappear in the single nymphal stage. We suggest that the traditional definitions of the terms larvae, nymphs and pseudergates should be revised because they cannot be satisfactorily applied to the castes of *Termitogeton*.

**KEY WORDS:** termites, social polymorphism, sex ratio, evolution, New Guinea