

## Research Paper

# The Impact of Ecological Conditions on the Prevalence of Malaria Among Orangutans

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### ABSTRACT

Contemporary human land use patterns have led to changes in orangutan ecology, such as the loss of habitat. One management response to orangutan habitat loss is to relocate orangutans into regions of intact, protected habitat. Young orangutans are also kept as pets and have at times been a valuable commodity in the illegal pet trade. In response to this situation, government authorities have taken law enforcement action by removing these animals from private hands and attempted to rehabilitate and release these orangutans. In relocating free-ranging orangutans, the animals are typically held isolated or with family members for <48 h and released, but during the course of rehabilitation, orangutans often spend some time in captive and semicaptive group settings. Captive/semicaptive groups have a higher density of orangutans than wild populations, and differ in other ways that may influence susceptibility to infectious disease. In order to determine the impact of these ecological settings on malaria, the prevalence of malaria was compared between 31 captive and semicaptive orangutans in a rehabilitation program at the Sepilok Orangutan Rehabilitation Centre and 43 wild orangutans being moved in a translocation project. The prevalence of malaria parasites, as determined by blood smear and *Plasmodium* genus-specific nested-polymerase chain reaction, was greater in the captive/semicaptive population (29 of 31) than in the wild population (5 of 43) even when accounting for age bias. This discrepancy is discussed in the context of population changes associated with the management of orangutans in captive/semicaptive setting, in particular a 50-fold increase in orangutan population density. The results provide an example of how an ecological change can influence pathogen prevalence. Key Words: Orangutans—Malaria—Ecology—*Plasmodium*—*Pongo pygmaeus*. Vector Borne Zoonotic Dis. 2, 97–103.

### INTRODUCTION

ORANGUTANS ARE AMONG our closest living relatives. They are the descendants of African apes that migrated to Europe and Asia

roughly 12–18 million years ago (Andrews and Cronin 1982), and are the only great apes outside of Africa. Two genetically distinct subspecies are recognized, *Pongo pygmaeus abelii* and *Pongo pygmaeus pygmaeus* (Zhi et al. 1996).

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