

# Mites of the Family Macrochelidae (Acari: Gamasida) from Sungai Wain, East Kalimantan, Indonesia

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Twenty-two mite species of four genera belonging to the family Macrochelidae were collected from the body surface of dung beetles (Scarabaeidae) in Sungai Wain, East Kalimantan, Indonesia. Three species, *Macrocheles dayaci* sp. nov., *M. riparius* sp. nov., and *M. wainensis* sp. nov., are described as new to science. Another eight species are recorded from Kalimantan for the first time.

**Key Words:** Acari, Macrochelidae, dung beetles, Sungai Wain, East Kalimantan, Indonesia.

## Introduction

Kalimantan, the Indonesian part of the island of Borneo in Southeast Asia, comprises the largest land area in the Major Sunda Islands in Indonesia. Several taxonomic studies on macrochelid mites have been carried out in Sumatra and Java in the Major Sunda Islands (e.g., Vitzthum 1925; Takaku 2001; Hartini and Takaku 2003a, b; Hartini *et al.* 2009), where more than 30 species have been recorded, but there has been no comprehensive study of macrochelids in Kalimantan. To date, 16 species of macrochelids have been recorded from Kalimantan by Hartini and Takaku (2003c, 2004) and Hartini *et al.* (2003), all collected from scarabaeine dung beetles. These species belong to three genera: *Macrocheles* (10 species), *Neopodocinum* (5 species), and *Holostaspella* (1 species). Although most of the species were collected from East Kalimantan, *Macrocheles hallidayi* Walter and Krantz, 1986, *M. kraepelini* (Berlese, 1905), and *M. sp. aff. glaber* (Müller, 1860) were also collected from Central Kalimantan. Of the 16 species which have been described, only one, *Neopodocinum kalimantanense* Hartini and Takaku, 2003, appear to be endemic to Kalimantan.

Sungai Wain and the forest surrounding it play an important role for people and local industry in Balikpapan, East Kalimantan. The Sungai Wain forest is the water catchment area for Balikpapan city (Frederiksson and De Kam, 1999) and a habitat for the endangered orangutan, *Pongo pygmaeus* (Linnaeus, 1760).

As a result of our investigation of macrochelid mites in Sungai Wain in 2006–2008, we found 1,564 mite specimens of 22 species belonging to four genera. Three of these spe-

cies are described here as new to science and eight species are new records from Kalimantan.

## Materials and Methods

Phoretic beetle hosts examined in the present study were collected in traps baited with fresh human dung or fish fillet set in several kinds of habitat (e.g., *Acacia* plantation, grassland) in Sungai Wain by A. Ueda and D. Dwibadra. All scarab beetle specimens were fixed in 70% ethyl alcohol in the field. Collected specimens from one trap were kept in the same vial. Some mites were collected from the ventral surface of the scarab beetles and others, detached from beetles, were collected from residue in the vials in which the scarabs had been fixed and preserved. All mite specimens were preserved in 70% ethyl alcohol. Some were dissected under a stereoscopic microscope after clearing in lactic acid. Each body part was mounted on a slide in PVA (polyvinyl alcohol-lactic acid mixture) medium. Observations were made with phase contrast and differential interference contrast microscopes. Illustrations were prepared with the aid of a drawing tube.

All measurements are given in micrometres ( $\mu\text{m}$ ). Dorsal chaetotaxy follows Halliday (1987) and other terminology follows Walter and Krantz (1986b).

The holotype specimen of each new species will be deposited in the collection of the Museum Zoologicum Bogoriense, Cibinong, Bogor, Indonesia (MZB), and the remaining specimens will be divided between the MZB and The Hokkaido University Museum, Sapporo, Japan.

Surveys were conducted at several sites around the Wain