

Scientific note

A scientific note on weight and sperm numbers of drones of *Apis nuluensis* Tingek, Koeniger and Koeniger, 1996

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Introduction

The weight of *Apis* drones and the number of spermatozoa they produce seem to be species-specific characters. While the weight of drones varies from 71 mg in *Apis andreniformis* (unpublished data) to 220 mg in *Apis mellifera* (Koeniger et al, 1993), sperm numbers range from 0.13 million in *Apis andreniformis* (Koeniger et al, 1990) to about 10 million in *Apis mellifera*. Drones of the two sympatric cavity nesting honeybees of Borneo (*Apis koschevnikovi* and *Apis cerana*) also show distinct differences in weight and number of spermatozoa. *A koschevnikovi* is considerably larger, the drone has a weight of 101.2 ± 4.1 mg and 1.7 ± 0.16 million spermatozoa (Koeniger et al, 1994). The drone of *A cerana* weighs 83.4 ± 5.3 mg (Koeniger et al, 1993) and has 1.0 ± 0.1 million spermatozoa (unpublished data from 20 drones). Recently, *Apis nuluensis*, a third cavity nesting species was described from the mountains of Borneo (Tingek et al, 1996).

Materials and methods

One colony of *A nuluensis* was found at the height of 2 040 m near Gunung Emas, Crocker Range in Sabah, Malaysia, from which five drones were used for sperm counting and for measuring the weight. The drones were weighed on an electric balance (accuracy ± 0.1 mg). Sperm was collected from the vesiculæ seminales (Koeniger et al, 1994). To avoid ejaculation during killing, the

drones were kept at cool temperature (4 °C) without food for 2 h. Spermatozoa were counted in a hemocyste counting chamber.

Results

A nuluensis drones had a weight of 107.1 ± 6.7 mg. The number of spermatozoa in the vesicula amounted to 1.3 ± 0.1 million.

Discussion

A nuluensis drones were heavier than those of *A koschevnikovi*. The sperm number (1.3 million) of *A nuluensis* drones, however, was smaller than in *A koschevnikovi*. Compared to *A cerana*, *A nuluensis* drones were heavier and had more spermatozoa. Considering all four cavity-dwelling *Apis* species, we clearly see that the Asian species form a relatively homogeneous group of moderate biodiversity in drone weight and sperm numbers and contrast to *A mellifera* which has the largest drones within *Apis* and more than five times as many spermatozoa. Also, compared to the extreme differences in sperm numbers of all *Apis*, including the free-nesting species, the diversity among the three sympatric cavity-dwelling species of Borneo is moderate. Although the interspecific diversity seems to be distinct, for further confirmation the sample size of *A nuluensis* (five drones of one colony) needs to be increased.

Note scientifique sur le poids des mâles d'*Apis nuluensis* Tingek, Koeniger et Koeniger, 1996 et sur leur nombre de spermatozoïdes

Wissenschaftliche Notiz über das Gewicht und die Anzahl der Spermatozoen bei Drohnen von *Apis nuluensis* Tingek, Koeniger und Koeniger, 1996

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