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[SHORT COMMUNICATION]

Establishing a Culture of *Eucorydia yasumatsui* Asahina (Insecta: Blattaria, Polyphagidae)

Mari FUJITA, Shota SHIMIZU and Ryuichiro MACHIDA

Graduate School of Life and Environmental Sciences, University of Tsukuba, Tsukuba, Ibaraki 305–8572, Japan
Current address: Sugadaira Montane Research Center, University of Tsukuba, Sugadaira Kogen, Ueda, Nagano 386–2204, Japan
E-mail: fujita@sugadaira.tsukuba.ac.jp (MF)

Insecta are the most prosperous group accounting for 75% of all animals in species. Representing 99% of Insecta in species, Neoptera are important in elucidating Insecta, and Polyneoptera, derived from the early explosive radiation of Neoptera into about a dozen of orders, are the significant group to reconstruct the groundplan and evolution of Neoptera. However, Polyneoptera, of which ordinal divergence traced back to far ancient time, are so difficult in reconstructing not only interrelationship between each order but also their groundplan, that there are more than 20 phylogenetic hypotheses proposed for the group itself (Klass, 2009). In Polyneoptera thus phylogenetically problematic, the Dictyoptera or the assemblage of Blattaria, Mantodea and Isoptera has been widely accepted and seems to be well established. However, the positioning of Dictyoptera in Polyneoptera has not been settled (Kristensen, 1991; Terry and Whiting, 2005), and the interrelationship between the three ordinal constituents of Dictyoptera has not been clarified (Ware *et al*., 2008). Furthermore, a closer affinity between Isoptera and an enigmatic blattarian family Cryptocercidae was suggested by Cleaveland *et al*. (1934) on the basis of their similar nesting and recently by Lo *et al*. (2000) from their molecular phylogenetic analysis, discounting the monophyly of Blattaria. Thus, a careful understanding of Blattaria is required for reconstruction of the groundplan and ordinal relationships of not only Dictyoptera but Polyneoptera. For the solution of phylogenetic problems, a comparative embryological approach is promising. Many embryological studies have been conducted on Blattaria. However, all of them concern the derived families known as pests, for example, Blattellidae and Blattidae (*e. g*., Wheeler, 1889; Heymons, 1895; Lenoir-rousseaux and Lender, 1970; Tanaka, 1976), and we know that these two families show great differences even in some features which have been employed as significant in insect comparative embryology such as the embryo's localization and blastokinesis. Aiming to reconstruct the embryological groundplan of Blattaria, we have started the embryological study of Polyphagidae, a candidate for the basal-most blattarian clade, using a Japanese polyphagid *Eucorydia yasumatsui* Asahina (Fig. 1A, B). However, this subtropical species, which is distributed only in the Yaeyama Islands of Okinawa Prefecture and Amami Island of Kagoshima Prefecture, is a very rare blattarian, and it is necessary to conduct an embryological study of *E. yasumatsui* to establish its culture. This time, we succeeded.

In April 2008, we collected 11 larvae in Komi, Iriomote Island, Yaeyama Islands, Okinawa Prefecture (first generation). Larvae collected were kept in a plastic case 14 cm in diameter and 6.5 cm in height with a moistened soil bottom (Fig. 2A) at room temperature (18–24℃), and fed on grained food for goldfish (HikariFlake GOLDFISH©, KYORIN): a grained chlorella tablet (Chlorella©, FANCL): a grained beer yeast tablet (EBIOS© ASAHI FOOD & HEALTHCARE): a grained balanced food (CalorieMate©, Otsuka Pharmaceutical) = 9 : 3 : 3 : 1. By February 2009, we had raised three male and seven female adults. These adults mated, and the females produced 81 oothecae, each of which included three to 12 eggs. The oothecae obtained were incubated in an incubator set at 23.5℃, and we could raise about 450 larvae (second generation). We reared these hatched larvae into adults and had obtained 29 oothecae by June 2010. To date, 117 larvae (third generation) have hatched out from 13 oothecae. Thus, we succeeded in establishing a culture of *E. yasumatsui*. According to data on 31 oothecae, the egg period of this species was 64.1 ± 11.9 days (n = 184 eggs).

We reared part of the second generation, separately keeping each in an 8 cm×5 cm×2 cm plastic case (Fig. 2B), aiming at clarifying the total number of instars of *E. yasumatsui*. Although the individuals observed decreased in number from 39 to 22, 19 individuals have since grown to the seventh instar and three to the eighth

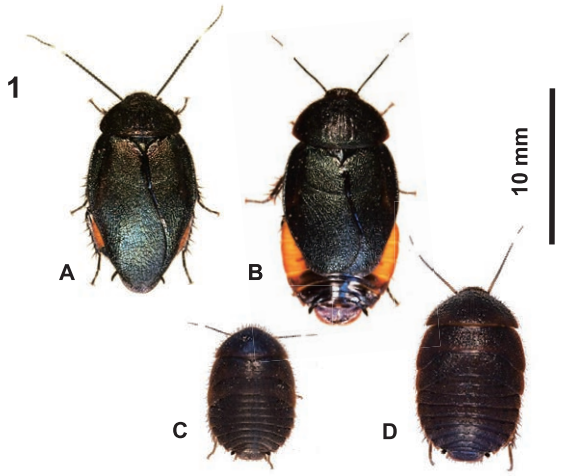

Fig. 1 Male (A), female adults (B), seventh (C) and eighth instar larvae (D) of *Eucorydia yasumatsui* Asahina.

instar (Fig. 1C, D). The pronotum of the eighth instar larvae, and male and female adults were 5.64 ± 0.52 mm (n = 4), 5.27 ± 0.28 mm (n = 17) and 6.05 ± 0.20 mm (n = 12) in width respectively. At present, the eighth instar seems to be the last instar although one more instar could exist before becoming adult.

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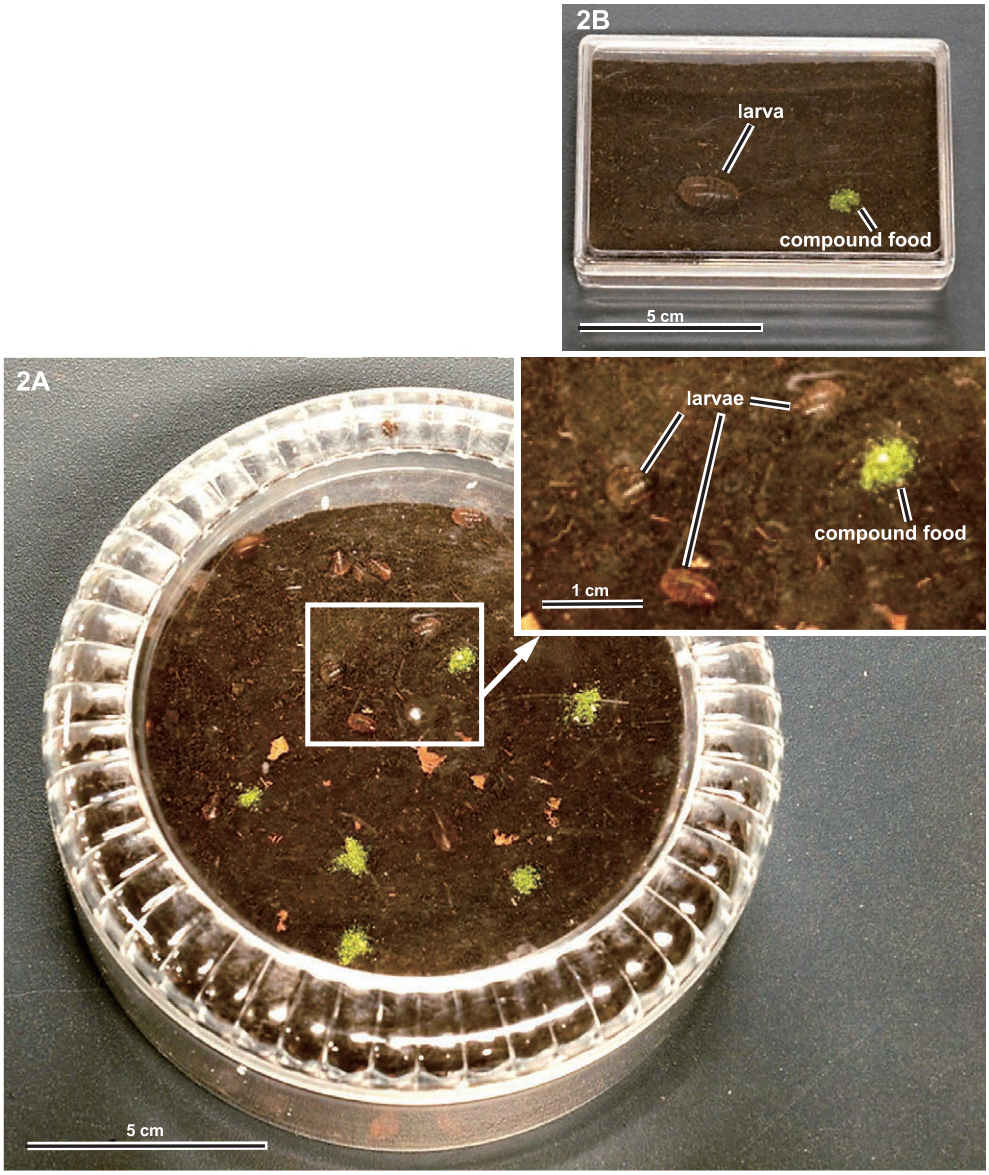

Fig. 2 Vessels for group (A) and separate (B) rearings.

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