AN UNDESCRIBED SPECIES OF THE GENUS DACTYLOPLEUSTES (CRUSTACEA: AMPHIPODA: PLEUSTIDAE) FROM HOKKAIDO, JAPAN

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In addition to the three species of the genus *Dactylopleustes* (Crustacea: Amphipoda: Pleustidae) so far reported from the world, we have found an undescribed species in association with the urchin, *Strongylocentrotus intermedius* (Agassiz, 1863) from the coast of Hokkaido, northern Japan. The morphology of the gnathopods, pereopods 5-7, uropods, telson, mandible and maxilla 1-2 are the major characteristics that distinguish the undescribed species from its congeners. *Dactylopleustes echinoides* Bousfield and Hendrycks, 1995 from Vancouver Island, Canada is the most similar to the undescribed species, and is redescribed briefly based on holotype borrowed from Canadian Museum of Nature. An amended key to *Dactylopleustes* species is provided and their known sea urchin hosts are listed.

THE *EPILACHNA ALTERNANS* COMPLEX (COLEOPTERA: COCCINELLIDAE) IN INDONESIA: THEIR PHYLOGENY AND DIVERSITY IN MORPHOLOGY AND HOST PLANTS

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We conducted a comparison of genitalia and a phylogenetic analysis for 14 populations of *Epilachna alternans* and similar forms collected from Sumatra and Java, Indonesia, which included various populations that differed in their external morphology (size and elytral patterns) and/or host plants. We determined the sequences of a part of mitochondrial 16S ribosomal DNA and constructed a gene tree using Neighbor-Joining method. Seven clusters, which were characterized by their geographical locations or host plants, and fine structure of genitalia, were recognized in the tree. However the phylogenetic relationship among these clusters was not resolved. The results indicated a complicated geographic pattern of this species complex involving sympatric and allopatric genetic divergence, and demonstrated differentiation among symparic populations that differed in their host plants. Based on the above results, we will discuss the mode of speciation in the *E. alternans* species complex.

TAXONOMIC RE-EVALUATION OF THE GENUS *BATHYCOPEA* (CRUSTACEA: ISOPODA: SPHAEROMATIDEA)

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The genus *Bathycopea* was known as the deep-sea living isopods from the world. I report two species belonging to the genus collected from Japan. Of these species, *Bathycopea parallela* Birstein from Otsuchi Bay was second record from Japanese coast. *Bathycopea* sp. 1 was similar to *B. typhlops* in the body shape, however, the two species are easily distinguishable by the presence of the eyes and broad uropods in *B.* sp. 1. The emended generic diagnosis was presented after the taxonomic re-evaluation based on the two species.

TWO UNDESCRIBED SPECIES OF DIPLOSOMA (ASCIDIACEA: DIDEMNIDAE) BEARING PROKARYOTIC ALGAE PROCHLORON FROM OKINAWAJIMA ISLAND, JAPAN

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In tropical or subtropical waters, some didemnid ascidians are known to havea symbiotic association with a prokaryotic algae Prochloron sp. Two undescribed species of Prochloron-bearing Diplosoma, D. sp. 1 and D. sp. 2, were found from coral reefs in Okinawajima Island, Japan. They attached on coral lime stones or corallines at the reef edges of subtidal zone (D. sp.1) or in a shallow reef lagoon (D. sp. 2). In these species, the colonies are thinner and the zooids are smaller than those of any other Prochloron-bearing Diplosoma species so far described. Moreover, each of these species has a unique combination of stigmal numbers: 5 stigmata in the first and third rows, 6 in the second row, and 4 in the fourth in D. sp. 1; 4 stigmata in the first and third rows, 5 in the second row, and 3 in the fourth in D. sp. 2. In both of the species, retractor muscle emerges from the zooid under the thorax.

WATER MITES OF THE GENUS *HYGROBATES* (ACARI: HYDRACHNIDIA: HYGROBATES) FROM JAPAN

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Among the water mites that live in aquatic environments, the genus *Hygrobates* mainly inhabits still water, i.e. lakes, ponds, and mid- and downstream parts of rivers. The genus *Hygrobates* has a global diversity of around 150 species, with 14 species so far known from Japan. An examination of three newly collected species of water mites from Shiga, Kyoto, Nara and Wakayama prefectures, Western Japan, with described *Hygrobates* species shows that the newly collected water mites are undescribed species of the subgenus *Hygrobates*. The three species share a character state in having a pair of setae on the pre-genital scrolite of the female. This character state has not been reported among other species of the genus *Hygrobates*. The three newly collected species are easily distinguished from one another by the following character states. The shape of the P-2 projection in *Hygrobates* sp. 1 is elongated, whereas in *H.* sp. 2 and sp. 3 it is truncated. In the female genital field, *H.* sp. 1 and sp. 2 have small genital plates, whereas *H.* sp. 3 has large genital plates. In the male genital field, *H.* sp. 1 and sp. 2 have a round posterior median projection, whereas *H.* sp. 3 has no projection.

OVARIAN STRUCTURE AND OOGENESIS OF A SOUTH AFRICAN HEEL-WALKER, *KAROOPHASMA BIEDOUWENSIS* (MANTOPHASMATODEA)

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Ovarian structure and oogenesis of a South African heel-walker, *Karoophasma biedouwensis* were examined light and transmission electron microscopically. The ovary of the adult female consisted of five or six pairs of ovarioles, each of which connected with the lateral oviduct. The ovariole was composed of an anterior terminal filament, germarium and vitellarium. The germarium, which contained a few oogonia and remarkably flattened prefollicular cells, was very short. No intercellular bridges connecting oogonia or immature oocytes with each other were found. In the vitellarium of the full grown ovary, there were seven to 14 developing oocytes, each of which was surrounded by a follicular epithelium, arranged in a single row, and the proximal one was chorionated oocyte. No nurse cells developed, and the ovariole type of Mantophasmatodea is a typical panoistic one. The mature oocytes were characterized by a large amount of fragmented endoplasmic reticula and few Golgi complexes. We compare the ovarian structure and oogenesis of Mantophasmatodea with those of other orthopteroid orders, and discuss likely affinity of Mantophasmatodea with Grylloblattodea.

DIVERSITY OF VERMIFORM EMBRYOS IN THE PHYLUM DICYEMIDA

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Morphology, cell numbers, and cellular composition were examined in vermiform embryos of 30 species of dicyemid mesozoans that are placed in 6 of the 8 genera known in the phylum. The following genera were studied: *Conocyema*, *Dicyema*, *Dicyemennea*, *Dicyemodeca*, *Microcyema*, and *Pseudicyema*. Vermiform embryos of *Conocyema* and *Microcyema* differ from the other genera in having a small number of peripheral cells and distinct calotte shapes. In *Conocyema* the calotte of vermiform embryos consists of 4 large cells whereas in *Microcyema* the calotte of vermiform embryos is a syncytium including 6 nuclei. Vermiform embryos typically have a constant peripheral cell number that is species-specific. Interspecific variations in total number of peripheral cells range from 10 to 40. The most frequent number of peripheral cells encountered in vermiform embryos is either 22 or 23. Differences in total number of peripheral cells are mostly due to differences in the number of trunk peripheral cells. In dicyemid species with a large number of peripheral cells interspecific variations in cell numbers occur in trunk peripheral cells.

THE DIFFERENCE OF BREEDING PERIOD AMONG COLONIES WITH DIFFERENT COLOR PATTERNS IN *BOTRYLLOIDES SIMODENSIS*

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Botrylloides simodensis is a colonial ascidian belonging to the family Botryllidae. This species was first reported in 1981, and one of the common species in the rocky shore around Shimoda. In this species, colonies show various colors and color patterns, and those colonies can be divided into some types with their color patterns. We observed the life histories of colonies belonging to each type in the same environment. In colonies of the one type, the period of sexual reproduction was from July to September as reported in the original description, but colonies of the other types performed sexual reproduction almost all the year round. This fact implies that the range