ENDOSYMBIOTIC BACTERIA IN TICKS AND THEIR RELATIOSHIPS TO PATHOGENIC SPECIES

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Ticks transmit various mammalian pathogens and also harbor intracellular symbiotes. To elucidate relationships among pathogens and symbiotes, a phylogenetic analysis of 16S rDNA from these two bacterial groups found in the ticks *Ixodes ovatus* and *Rhipicephalus sanguineus* was performed. The sequences of several different intracellular symbiotes were obtained, and based on homology searches these belong to the genera *Coxiella*, *Borrelia*, *Spiroplasma* and *Rickettsia* . *Coxiella* were the most commonly found bacteria. Sequences of symbiotic *Coxiella* from the same species of tick found in different locations were very similar, indicating that these bacteria are endosymbiotic. Pathogenic *Coxiella burnetii* isolated from mammales in various worldwide locations formed an unambiguous monophyletic group, which formed a well supported sister group relationship to a symbiotic tick *Coxiella* . This result suggests that the origin of the pathogen *Coxiella burnetii* is from a tick endosymbiote.

KARYOTYPE ANALYSIS OF *HALIPLANELLA LINEATA* USING GIEMSA BANDING AND SILVER STAINING

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The karyotype of the sea anemone Haliplanella lineata (= H. luciae) was analysed in early embryos by C- and G-banding methods and silver staining. A region of constitutive heterochromatin was located at the the centromeric position of all chromosome pairs. Nucleolus organizer regions appeared in the terminal position of the long arms of subtelocentric chromosomes. The minimum number of chromosomes bearing NORs per cell was two and the maximum, five. G-banding and silver staining showed alternating dark-light banding patterns, which allowed identification of homologues. Measurements of relative lengths and arm ratio of the chromosomes were made. In the first group comprising 6 pairs of large chromosomes, homologous chromosomes were identified.

Haliplanella lineata is characterized by a high degree of morphological and ecological diversity. The presence of diversified karyotypes in this species therefore seems likely. Hence, it is necessary to perform karyological analyses of further specimens from additional localities.

COMPARATIVE MORPHOLOGY OF LARVAL SKELETONS IN SEA URCHINS

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Echinoplutei have an internal calcareous skeleton. Within a given family, species share the similar skeletal morphology characters to the family but can be distinguished based on variations in certain features. In this study I compared the skeletal forms of 9 taxa of the family Echinometridae and 2 species from a closely related family to identify the morphological features useful to distinguish each species. The features I observed were the length and width of the body and postoral arms. I also compared the distance between fenestration the number of calcite rods that make the skeleton and the size, shape and number of projections on each rod. Variation was not found in the number of recurrent rod. The number of the calcite rods that make the skeleton, the body length:width ratio and the number, size and shape of projections on the rods, however, showed wide interspecific difference.

SWIMMING SWARMS OF A USUALLY BENTHIC ENTEROPNEUST, GLANDICEPS SP. IN THE SETO INLAND SEA, JAPAN, FOUND IN 1998

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Swimming of post-metamorphosed enteropneusts has been very rarely reported exclusively in the genus Glandiceps of the family Spengeliidae by Ikeda (1908) in the Seto Inland Sea, Japan, Spengel (1909) off Java, and by Dawydoff (1952) off Viet Nam. After ca. 90 years' interval since Ikeda, from the middle of August to the beginning of October, 1998, swimming swarms were found only at night by some fishermen and anglers at several areas in Harima-nada of the Seto Inland Sea, with a measured density of 44 immatured individuals in a bucket of 5 liters. In the middle of October and afterwards, we collected many individuals of Glandiceps sp., 5 to 20 cm or longer, from muddy bottom at depths of 3-11 m, at the port of Sakate, Shodoshima Is., one of the localities where the swarms were detected. The density at the bottom reached 25 individuals per 20 cm x 20 cm. The bottom surface was furished abundantly with small holes, corresponding probably to entrances of the animal's burrows. Our nocturnal laboratory observation of the collected specimens in October of 1998 revealed that they swam forwards by undulating dorsoventrally the long and flexible trunk which was depressed remarkably, and at the same time by rotating slowly around the longitudinal axis, clockwise as seen from the rear. Swimming was inhibited by a strong illumination, with the result of the animal's slow sinking. Some references were made to the dynamics of the Sakate population and to the body morphology.

A RARE ROTIFER, *KELLICOTTIA BOSTONIENSIS* FROM JAPAN

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Of 3 taxa of *Kellicottia*, *K.longispina* is widely distributed in cold water lakes. *K.bostoniensis*, regarded as an endemic species to North America, has widened its habitats to Sweden having been transported in ballast water and through drainage. *K.longiseta tayrmirica* has only been reported from Taymir, northern Siberia. In Japan, *K.bostoniensis* was firstly detected in the sample collected on 02/II'98 from Lake Yasaka(34°14'N,132°10'E). A reexamination of the samples treated as *K.longispina* by Sudzuki('82,'94) revealed that those at least from Lake Hibara and Pond Gan'amida were identified as *K.bostoniensis*. In Lake Hibara (37°38'–37°44'N,140°03'–140°04'E), *K.bostoniensis* occurred from May to October at 0–15m,with the density 0.1–23.4 ind./l / in 1984,but in 1993 it was less than 0.1.In Gan'amida fish pond(37°50'N,140° 55'E,surface area 0.07km^2,maxim.depth 10m) *K.bostoniensis* occurred on 17/VI in 1980 at st.1(dens.=1.9;0.5m in depth), st.2(4.7;0.5m) and st.3(6.3;0.5m).But,not a single specimen was observed on 17/VII,22/VIII,17/IX and 17/X at any of the stations.In the Japanese specimens, the total length=340 –450μm,the longest occipital spines=130–185μm and the posterior spine=103–120μm.

MONOSTILIFEROUS HOPLONEMERTEAN FROM OTSUCHI BAY, JAPAN

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Monostilifera is one of the superorder in the phylum Nemertea, characterized by having one stylet on its proboscidial apparatus. This group consists of about 94 genera, including c.a. 500 species. Hitherto, 14 genera and 39 species of nemerteans belonging to this group have been reported from Japanese waters. A specimen obtained from Otsuchi Bay, Iwate prefecture in 1997, is identified as a member of Correanemertes by the nature of their longitudinal musculature and proboscis insertion. The present species can be distinguished from C. bioculatus, the only known species of this genus, not only by their body color, but also by the internal morphology such as the intestinal caecum or the arrangement of the cephalic gland. This finding comprises the first report of this genus from the Pacific.