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Overview of the genus *Nephroselmis* from the Ryukyu Islands (Chlorophyta, Nephroselmiales)

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Is. (GBR), and thus, they are supposed to be widely distributed at least in tropical West Pacific. This may indicate that many unknown species are yet to be described in tropics, and we recognized other three *Diplosoma* that are potentially undescribed species. The three *Diplosoma* species can be distinguishable with the unique pattern of the stigmatal numbers in the branchial sac. For instance, the stigmatal numbers are 6, 7, 6, and 5 from the top row to the bottom in one species. As for the three species, we unfortunately have not obtained the colonies laden embryos that would provide several taxonomical features. On the other hand, some described species should be carefully examined, because there are some arguments about synonyms; *Lissoclinum bistratum* – *L. timorensis*, *Trididemnum cyclops* – *T. paracyclops*, and *Trididemnum clinides* – *T. paraclinides*. There are several color-morph types and size-morph types in *Didemnum molle*, and we found differences in the contents of ultraviolet-absorbing substances, reproductive season, and commensal crustacean fauna between the two color-morph types, suggesting that this species may include one or several cryptic species. A taxonomic survey based on both detailed morphology and the molecular phylogeny of several potential synonyms or morph types from various sites is required to clarify this problem.

Oral -8

New and interesting species of gobies from Singapore

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The family Gobiidae comprises of some 2000 small teleost fishes commonly known as gobies. A recent faunistic survey of this group carried out in Singapore revealed that there are 149 species with about a quarter of them not recently found or reported from the island. The presentation discusses these dubious records and presents new and interesting finds.

Oral -9

Overview of the genus *Nephroselmis* from the Ryukyu Islands (Chlorophyta, Nephroselmidales)

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Nephroselmis is a green flagellate genus and was established by Stein in 1878 based on a freshwater species, *N. olivacea*. It possesses compressed cells in the right-left axis, two unequal and heterodynamic flagella, and simple to complex scales forming the Golgi body covering the surface of body and flagella. The SSU rDNA tree suggests that the family Nephroselmidaceae, which contains only the type genus *Nephroselmis*, is closely related to the core chlorophytes (Chlorophyceae + Trebouxiophyceae + Ulvophyceae + Chlorodendrales). The genus *Nephroselmis* is therefore a key organism in the evolution of the Chlorophyta *sensu stricto* and the origin of the major part of green algae. Phylogenetic studies on various species of *Nephroselmis* using morphological and molecular characters are therefore important. At present, 12 *Nephroselmis* species have been described but for five out of the 12 species there is very limited information and their existence as valid species is doubtful. Aside from one freshwater species, the remaining six species have been reported from marine environments. *Nephroselmis* swims with the short flagellum beating ahead and a long flagellum trailing behind. Because of its unique swimming behavior, *Nephroselmis* cells can be easily identified and isolated under an inverted microscope in samples, and was collected from various localities of the Ryukyu Islands. Over five years, our laboratory established 122 strains of *Nephroselmis*. Consequently, the strains could be divided into eight

morphological groups. Four groups are likely to correspond to four known species, *N. olivacea*, *N. anterostigmatica*, *N. astigmatica* and *N. pyriformis*. The remaining four groups may contain *N. gaoae*, *N. minuta*, *N. rotunda* or new taxa but detailed ultrastructural observations are needed to identify these groups conclusively. To help achieve this, some strains were subjected to TEM observations, pigment analyses and molecular phylogenetic analyses. Morphologically, three potentially undescribed groups are designated here as three undescribed species, sp. 1 to sp. 3. The molecular phylogenetic analysis of 18S rDNA sequences revealed that the three undescribed species were distributed in a monophyletic genus *Nephroselmis*. The genus was divided into four monophyletic clades (A to D) and each clade was supported by relatively high bootstrap values. In addition, pigment compositions of carotenoids and xanthophylls were somewhat related with molecular phylogeny of the genus *Nephroselmis*. The rest of the collected strains from the Ryukyu Islands may also contain previously unrecorded known or unknown species, and further characterizations are needed. In this paper we present an overview of some of our work on the unique genus *Nephroselmis*.

Oral -10

Factors affecting the current diversity and distributions of mammals in the Ryukyu Archipelago, Japan

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The Ryukyu Archipelago lies between Kyushu of Japan and Taiwan, and consists of more than 150 islands. The northern tip of this archipelago belongs to the temperate zone, whereas the remainder to the subtropical zone. Within the Ryukyu Archipelago, following eight island assemblages are usually recognized—Osumi Group, Tokara Group, Amami Group, Okinawa Group, Miyako Group, Yaeyama Group, Senkaku Group, and Daito Group. Components of the first six assemblages form an island chain from northeast to southwest and are separated from the continent by East China Sea. The Senkaku Group is located on the continental shelf north of the Yaeyama Group, whereas the Daito Group, the only representative of oceanic islands in this region, are located ca. 360 km east of the Okinawa Group. The Tokara Group is further divided into two parts, the northern and southern Tokara islands, by the Tokara Tectonic Strait, which is often considered as a border between the Palearctic and the Oriental zoogeographical realms, being referred to as the Watase's Line. The Kerama Gap, located between the Okinawa Group and the Miyako Group, is often considered as another important biogeographical border under the reference name, the Hachisuka's Line.

The fauna of the Ryukyus is generally characterized by high lineage diversity and remarkable endemism as a whole, and distinct population divergence in many lineages among islands and island assemblages. These faunal characteristics are usually attributed to the complicated geological history of this archipelago. We review mammal fauna of the Ryukyu Archipelago and discuss geographical features of its diversity by considering not only the paleogeographical process of this archipelago, but also ecological properties of this group of organisms and insular environments. We try to make best use of the results from most recent studies, although quite a few taxa obviously need further evaluation for their taxonomic status (e.g., the Iriomote cat), or indigenism of the Ryukyu populations (e.g., house mouse), or actual occurrence in this region (e.g., various forest-dwelling bats).

A total of 35 putatively indigenous species of terrestrial mammals are known from the Ryukyu Archipelago. Distributions of these species can be classified to several types. From a viewpoint of endemism, for example, five species are confined to single islands and four to single island groups, whereas five species are shared by two or more island groups and one by the Ryukyu Archipelago and Taiwan. The remaining 20 species are widely distributed, although six of them are still endemic to Japan, and many of the remainder need further taxonomic studies and distribution surveys (see above).

We chiefly discuss three biogeographical features of mammals of the Ryukyu Archipelago.

1) Scarcity and range limitation of medium- and large-bodied mammals in this region. This seems to be related to various biotic and abiotic environmental factors, such as habitat diversity and community structure on each island. Small area and low altitude of most Ryukyu islands, obviously reflecting their low habitat diversity and simple community structure, are likely to be strictly limiting the chance for such mammals to establish populations there, unless they acquire certain ecological specializations as