

โครงการหนึ่งอาจารย์หนึ่งผลงาน ประจำปี 2547

ชื่อโครงการ

"การตีพิมพ์และเผยแพร่งานวิจัยในการประชุมวิชาการ
ระดับชาติหรือนานาชาติหรือในวารสารวิชาการระดับชาติ
หรือนานาชาติ"

ผู้ช่วยศาสตราจารย์ ดร. พาณี วรรณนิธิกุล
สาขาวิชาชีววิทยา สำนักวิชาวิทยาศาสตร์
มหาวิทยาลัยเทคโนโลยีสุรนารี

PROCEEDINGS of

THE SIXTH INTERNATIONAL CONGRESS OF ZOOLOGY

AUGUST 23-27, 2004, BEIJING, CHINA



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ENTRAPPED DEMOSPONGE SPICULES IN HEXACTINELLID SPONGES FROM THE EOCENE OF CHATHAM ISLAND, NEW ZEALAND.

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In the New Zealand region, sponge body fossils have been recorded from the Chatham Islands, West Auckland and Port Waikato, although only one (*Pleroma aotea* Kelly, from the Oligocene of South Island), has been formally described. This is a lithistid and, significantly, is extant on north-eastern New Zealand seamounts. An extensive fauna of Oligocene sponge spicules is known from sediments near Oamaru. A similar, but less diverse fauna has been collected from the Tutuiri Greensand (late Palaeocene) outcropping on the north coast of Chatham Island. The majority of this fauna is hexactinellid, comprising extremely delicate siliceous networks embedded in friable sandstones. The sediment within and surrounding these skeletons contains numerous entrapped siliceous demosponge spicules but these spicules represent only a subset of the taxa described from the Oamaru dis-

trict. Many of the spicules (which are representative of both astrophorid and lithistid sponges), are extremely well preserved, and in those in which clear silica remains, inception canals are visible. The Tutuiri Greensand collection is remarkable in that the body skeletons are exclusively those of hexactinellid sponges. Further, the taxa are very similar to those now living on the Chatham Rise at depths of between 200-2000m. This depth is not incompatible with the inferred depositional environment for the Tutuiri Greensand, which based upon foraminiferal and sedimentological data, has been deduced as mid to inner shelf. What is significant here is that late Palaeocene hexactinellids, astrophorids and lithistids, unlike some other invertebrate groups such as barnacles, have not significantly changed habitat during the Cainozoic.

589 and 590

Withdrawal

591

SHAPE OF SAGITTA AND SULCUS ACUSTICUS OF SCIAENIDAE FROM SOUTHERN COAST OF THAILAND

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The sciaenidae of order Perciformes are very economically important fishes which distribute in coastal tropical and subtropical waters. Shapes of sagitta and sulcus acusticus on sagitta of fish in genus *Otolithes*, *Dendrophysa* and *Daysciaena* from southern coast of Thailand are investigated by scanning electron microscope. The differences of sagittal shapes and sulcus shapes are found. The sagittal shapes can be separated into three types, round-triangular, round-oval and oval shape. The sulcus is clearly differentiated into

ostium and cauda, heterosulcoid types with para-ostial opening, which also shows significant differences among three genera. Three distinct characters of ostium are identified, mushroom-shaped with lobed ventrally, heart-shaped and mushroom-shaped with broad lobe. In contrast, the cauda has only two characters; straight, gentle flexed at tip and initially horizontal, strong flexed at tip. Although the sagittal shapes and sulcus characters of these sciaenidae are not quite the same, it would be accepted for their

similarity within these genera. The similarity of these morphology morphological characters may relate to phylogenetic closeness between species and might be

useful for phylogenetic study. The morphology of sagitta and sulcus are also species specific characters which can be used for identification of fish species.

592

SAGITTA MORPHOLOGY OF SOME FISHES IN FAMILY BELONTIDAE FROM SOUTHERN AREA OF THAILAND

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Labyrinthfishes (*Betta*, *Trichogaster* and *Trichopis*) of the family Belontiidae, order Perciformes are collected from southern area of Thailand. Sagittal otoliths are extracted from skulls, cleaned and stored dry in vials. Scanning electron photomicrographs reveal distinct characters of these sagittae which have never been reported in any fish sagittae, depression of the anterior rostrum and projection of the crista superior into excisura notch. Triangular-shaped depression of anterior rostrum is found in *Betta* spp. (*B. imbellis*, *B. simplex*, *B. splendens* Siamese and *B. splendens* Chinese) and *Trichopis vittatus* but it is

oval-shaped in *Trichogaster* spp. (*Trichogaster leeri*, *T. tricopterus* and *T. pectoralis*). The projection of the crista superior into excisura notch is found only in *Trichogaster* spp. and *Trichopis vittatus*. The sagitta shapes are separated into two types, oval in *Betta* spp. and ovate in *Trichogaster* spp. and *Trichopis vittatus*. Five differences of margin sculpturing of these sagittae are found and described. The distinguishable sagitta morphology found in this study is specific character of family Belontiidae and will be able to use for identification of fish family and species.

593

IS A SYLLABLE PHYLOGENETIC SIGNAL?

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The paper reported vocalizations of endemic Tibet Plateau steppe sparrow, Red-necked Snow Finch (*Pyrgilauda ruficollis*) by using SAS Lab Pro. The complexity and stability of sounds were studied by subject similarity contrast and multivariate contrast. The results indicate that songs of *P. ruficollis* have high complexity with varied song types, song phrases, song syllable and their combination. One shared song syllable by Snow Finch (*M. nivalis*), Black-winged Snow Finch (*M. adamsi*), Plain-backed Snow Finch (*P. blanfordi*) and Red-necked Snow Finch was selected as 'segment' of the whole song to compare the relationship among them. The similarity contrast and cluster analysis through SPSS were con-

ducted to construct the similarity dendrogram based on this shared syllable's acoustic parameters including the peak frequency (HF), the lowest frequency (LF), the main frequency (MPF) and duration (DUR). The results reveal that the similarity is accordant with those from morphological clustering and as well as molecular phylogeny. The syllable based similarity among these snow finches were considered homologous and derived through a common ancestry, alternatively, the cultural transmission and ecological convergence among these closely related relatives may exist. Further studies encoding this song Phylogenetic signal of snow finches are needed.

NSFC 30270203 & NSFC 30170126 supported