

IDENTIFICATION, PREVALENCE, MEAN INTENSITY
AND ABUNDANCE OF TRICHODINIDS
(PROTOZOA : CILIOPHORA : PERITRICHIDA)
FROM *CYPRINUS CARPIO* (KOI)
AT SUNGAI SIPUT, PERAK

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MASTER OF SCIENCE
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Thesis Submitted in Fulfillment of the Requirement for the
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Abstract of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfillment of the requirements for the degree of Master of Science

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KYAI DATUNORHANI ABUJ. MANAN

June 2009

Chairperson : Professor D.
Member : Associate Professor Abol Muzall Anshok Bolong, Ph.D.
Faculty : Agrotechnology and Food Science

DEDICATION

***This work is dedicated especially to my parents,
my sisters, my brother & my supervisor***

...I love you all...

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SYAIDATUNORHANI ABDUL MANAN

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Trichodinid parasites belonging to the order Mobilina and family Trichodinidae are found infecting the skin, fins and gills of *Cyprinus carpio* (Koi) of Sungai Siput, Perak. Studies were carried out at 2 stations, namely S1-Rimba Panjang and S2-Sungai Buloh starting from April 2006 to June 2007. Diagnosis of 120 Koi fish revealed the presence of six species and one genus of Trichodinid ciliates, namely *Trichodina acuta*, *Trichodina heterodentata*, *Trichodina nobilis*, *Trichodina mutabilis*, *Trichodina nigra*, *Trichodinella epizootica* and *Tripartiella* sp.

The morphological features of these trichodinids were examined through light and electron microscopy to identify the species and the results were compared with other known recorded Trichodinid species. Data analysis was determined by the calculation of prevalence, mean intensity, abundance and percentage abundance. Infestation of this Trichodinid was higher in S1-Rimba Panjang with 54749 parasites compared to S2-

Sungai Buloh with only 3067 parasites. Fish were heavily infected with these parasites on 15th April 2006 and 25th June 2006 in station 1 with the prevalence of 100% and in station 2 on 15th January 2007 with the prevalence of 90%.

In this study, even though *Trichodina acuta* and *Trichodina nobilis* were the highest species in station 1 and station 2, the dominant species infected *Cyprinus carpio* in this study was *Trichodina heterodentata* with the prevalence of about 95%. Therefore, it can be concluded that overall, within the diversity of Trichodinids, *Trichodina heterodentata* widely infects Koi fish in Perak.

The morphological characteristic of denticles was used to distinguish the different species of Trichodinids. In total, the number of denticles and radial pins for each different species of Trichodinid are as follows; *Trichodina acuta*, 17 – 22 and 10 - 12; *Trichodina heterodentata*, 20 – 24 and 10 - 13; *Trichodina nobilis*, 18 – 27 and 10 - 14; *Trichodina mutabilis*, 21 – 27 and 11 - 13; *Trichodina nigra*, 18 – 21 and 9 - 11; *Trichodinella epizootica*, 20 - 22 and 5 - 6; *Tripartiella*, 19 - 25 with none radial pins detected. This shows that each species has an intraspecific morphological variability in denticle number.

Result shows that the asexual reproduction of family Trichodinidae was by binary fission that starts with the division of nucleus, continued by the division process of adhesive disc and the development of radial pins, which is finally followed by the process of developing new denticles starting from the central part, blade and thorns (rays) of the denticle. Old denticles will be reabsorbed to the center part of the disc and obscured.

Abstrak tesis yang dikemukakan kepada Senat Universiti Malaysia Terengganu sebagai memenuhi keperluan untuk ijazah Master Sains.

PENGENALPASTIAN, PREVALEN, MIN KEAMATAN DAN KELIMPAHAN
TRICHODINIDS (PROTOZOA: CILIOPHORA: PERITRICHIDA) PADA
CYPRINUS CARPIO (KOI) DI SUNGAI SIPUT, PERAK

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Fakulti : Agroteknologi dan Sains Makanan

Parasit Trichodinid adalah tergolong dalam order Mobilina dan famili Trichodinidae yang menjangkiti kulit, sirip dan insang *Cyprinus carpio* (Koi) di Sungai Siput, Perak. Kajian telah dijalankan di dua stesen, iaitu S1-Rimba Panjang dan S2-Sungai Buloh pada April 2006 hingga Jun 2007. Diagnosa pada 120 ikan Koi menunjukkan kehadiran 6 spesies dan 1 genus siliata Trichodinid, iaitu *Trichodina acuta*, *Trichodina heterodentata*, *Trichodina nobilis*, *Trichodina mutabilis*, *Trichodina nigra*, *Trichodinella epizootica* dan *Tripartiella* sp.

Ciri morfologi untuk Trichodinid ini telah diperiksa menggunakan mikroskop cahaya dan mikroskop elektron untuk mengenalpasti spesies Trichodinid serta membandingkan keputusan dengan spesies Trichodinid lain yang telah diketahui sebelum ini. Analisis data telah ditentukan melalui pengiraan prevalen, min keamatan, kelimpahan dan peratus kelimpahan. Jangkitan Trichodinid adalah paling tinggi di S1-Rimba Panjang dengan

54749 parasit dan di S2-Sungai Buloh cuma 3067 parasit. Ikan yang paling tinggi dijangkiti parasit adalah di stesen 1 pada 15 April 2006 dan 25 June 2006 dengan prevalen ialah 100% dan di stesen 2 pada 15 January 2007 dengan prevalen ialah 90%.

Dalam kajian ini, walaupun *Trichodina acuta* dan *Trichodina nobilis* adalah spesies yang paling tinggi di stesen 1 dan stesen 2 tetapi *Trichodina heterodentata* adalah spesies yang dominan menjangkiti *Cyprinus carpio* dengan prevalen ialah 95%. Oleh itu, secara keseluruhannya dapat disimpulkan, di dalam diversiti Trichodinid, *Trichodina heterodentata* telah menjangkiti secara meluas pada ikan Koi di Perak.

Ciri morfologi untuk dentikel digunakan untuk membezakan setiap spesies dalam Trichodinid. Secara keseluruhannya, bilangan dentikel dan bilangan radial pin untuk *Trichodina acuta*, 17- 22 dan 10 - 12; *Trichodina heterodentata*, 20 – 24 dan 10 - 13; *Trichodina nobilis*, 18 – 27 dan 10 - 14; *Trichodina mutabilis*, 21 – 27 dan 11 - 13; *Trichodina nigra*, 18 – 21 dan 9 - 11; *Trichodinella epizootica*, 20 - 22 dan 5 – 6; *Tripartiella*, 19 - 25 dan radial pin tidak dapat dikenalpasti. Ini menunjukkan bahawa setiap spesies yang dijumpai mempunyai perbezaan morfologi intraspesifik bagi bilangan dentikel.

Kajian telah menunjukkan pembiakan aseksual bagi famili Trichodinidae adalah secara belahan dedua yang bermula dengan proses pembahagian nukleus. Kemudian diikuti dengan proses pembahagian cakera melekat dengan pembentukan pin radial. Akhirnya, proses pembentukan dentikel baru bermula dengan bahagian tengah dentikel, mata bilah