

ISOLATION AND CHARACTERIZATION OF PARTIAL
MITOCHONDRIAL COI GENE FROM HARPACTICOID
COPEPOD, *Leptocaris canariensis*
(LANG, 1965), UMT STRAIN.

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Isolation and characterization of partial mitochondrial coi gene from harpacticoid copepod, *Leptocaris canariensis* (LANG, 1965), UMT strain / Khor Wai Ho.

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Abstract: This study focuses on the isolation and characterization of partial mitochondrial COI gene from the harpacticoid copepod, *Leptocaris canariensis* (Lang, 1965), UMT strain. The total genomic DNA was extracted from the copepods and the partial COI gene was amplified using the appropriate primers. A 343 bp partial mitochondrial COI gene sequence was obtained. The partial COI gene sequence was compared with the GenBank database using all the available sequences for the partial COI gene of *L. canariensis* maintained at UMT and the consistency of the sequence was confirmed with the GenBank database. The BLAST analysis confirmed the partial COI gene sequence of the copepod and an improved sequence for the partial COI gene of *L. canariensis* along with related sequences. The difference between the partial sequence of *L. canariensis* maintained at UMT and the GenBank database of *L. canariensis* for different strains. The study will contribute to the knowledge of molecular biology of harpacticoid copepods and the genetic diversity of *L. canariensis* partial COI gene as reference for identification of the species.

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Copepods, especially from the order Harpacticoida are gaining attention as superior viable live feed for larviculture. One of the possible local candidates being cultured in UMT is *Leptocaris canariensis* (Copepoda: Harpacticoida). However, little is known about the molecular aspect of this species. In this study, the partial mitochondrial COI gene from *L. canariensis* UMT strain was successfully amplified. A 582 bp partial mitochondrial COI gene sequence was obtained. Analysis of partial COI sequences of *L. canariensis* revealed 100% similarity among all the individual copepods, verifying the purity of *L. canariensis* maintained in UMT and the consistency of the optimized extraction and amplification protocols done in this study. BLAST analysis confirmed that the obtained sequences were from COI region and of copepod origin (with E-value $< e^{-10}$). Phylogenetic analysis of *L. canariensis* along with selected outgroups from different taxa level further supports the purity of *L. canariensis* maintained and validates the taxonomy of *L. canariensis* up to the subclass level: Copepoda. This study will serve as the first documentation of molecular studies done on harpacticoids from the genus *Leptocaris*. The availability of *L. canariensis* partial COI sequence as reference will spearheads many more research in various fields in the near future.

**PEMENCILAN DAN PENCIRIAN GEN SEPARA MITOKONDRIA COI DARI
KOPEPOD HARPACTIKOID, *Leptocaris canariensis* (LANG, 1965), STRAIN
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Kopepod, terutamanya dari order Harpacticoida semakin mendapat perhatian sebagai makanan hidup yang lebih bermutu untuk pengkulturan larva-larva ikan. Salah satu calon tempatan yang dikultur di dalam UMT ialah *Leptocaris canariensis* (Copepoda: Harpacticoida). Namun, serba sedikit sahaja yang diketahui tentang aspek molecular spesis ini. Dalam kajian ini, gen separa mitokondria COI *L. canariensis* strain UMT telah berjaya diamplifikasi. Satu jujukan gen separa mitokondria COI yang bersaiz 582 bp telah diperolehi. Analisis terhadap jujukan-jujukan separa COI *L. canariensis* menunjukkan 100% persamaan antara semua individu *L. Canariensis* yang dikaji. Ini membuktikan ketulenan *L.canariensis* yang dipelihara di dalam UMT dan kejituan protokol-protokol pengekstrakan dan pengamplifikasian yang telah diubahsuaikan. Analisis BLAST membuktikan bahawa jujukan-jujukan yang diperolehi memang berasal dari kawasan COI dan berasal dari kopepod (dengan nilai $E < e^{-10}$). Analisis filogenetik terhadap *L. canariensis* dan kumpulan luar yang dipilih dari taksa yang berlainan menyokong lagi ketulenan *L. canariensis* yang dipelihara dan membuktikan taksonomi *L. canariensis* sehingga ke tahap subclass: Copepoda. Kajian ini merupakan dokumentasi kajian molekular yang pertama dilakukan ke atas harpaktikoid dari genus *Leptocaris*. Kewujudan jujukan separa COI *L. canariensis* sebagai rujukan akan merangsang lebih banyak kajian dalam pelbagai bidang pada masa akan datang.