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**BIOPROSPECTING OF SEAHORSES TRADED AS TRADITIONAL
MEDICINE: ITS NUTRITIONAL VALUES, ANTI-OXIDATION AND
ANTI-MICROBIAL ACTIVITIES**

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Synopsis

Seahorses are not well bioprospected based on scientific data though they are traded around the world for use as traditional medicines and aquarium fishes. Asian countries, including Malaysia are heavily involved in this trade which resulted in approximately 20 million seahorses are collected from the wild annually (Vincent, 1996). Seahorses are thought to resolve an extremely wide range of health problems despite the lacking of scientific data on nutritional value and active ingredients of the product. The present study conducted to analyse the nutritional values, total polyphenol content (TPC), anti-oxidation and antimicrobial activities of seahorse product available in the local market to support the alleged health benefits. Moisture, crude lipid, crude protein and crude ash were determined using standard methods (AOAC 1990). The TPC was assessed by the Folin-Ciocalteu's method, while the anti-oxidative activities were determined by two different methods; scavenging 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radicals and ferric reducing ability plasma (FRAP) assays. The antimicrobial properties of *Hippocampus barboursi* extracts were evaluated using disc diffusion method. The crude protein, crude lipid, ash and moisture contents (% dry weight) ranged from 58 – 69%, 0.6 – 5.2%, 18.7 – 26.8% and 14.6 – 19.0%, respectively. The control sample (live seahorses) showed significantly higher ($P < 0.05$) protein than the dried product. Male seahorses tend to have low content of lipid but high in ash compared to the females. Factors such as freshness and size of the seahorses may influence the proximate composition. The TPC content extracts of *H. barboursi* ranged from 2.99 to 5.00 mg GAE/g. The ability to reduce DPPH was strongest in ethanol extract and lowest in ethyl acetate extract. Contradictory, the antioxidant property of *H. barboursi* in ethanol extracts are much lower than in ethyl acetate and methanol extracts. The values of TPC, DPPH and FRAP assays showed the existence of a significant negative relationship between DPPH and FRAP assays ($r = 0.909$, $p < 0.01$). Only male ethyl acetate extract of *H. barboursi* showed anti-microbial activity against both *C. aureus* and *S. aureus*. These findings indicated that seahorse, *H. barboursi* is a potential source of natural anti-oxidant and possess some anti-microbial activities against the harmful bacteria strain. The results obtained from the present study are important in the effort to conserve the species and promote seahorse aquaculture.

Sinopsis

Kuda laut tidak dikaji secara saintifik dengan sewajarnya walaupun ia di dagangkan di seluruh dunia untuk tujuan perubatan tradisional dan ikan hiasan. Negara-negara Asian termasuk Malaysia terlibat dalam perdagangan ini yang mengakibatkan hampir 20 juta kuda laut di ambil dari kawasan semulajadi setiap tahun (Vincent, 1996). Kuda laut dipercayai dapat menyembuhkan banyak jenis masalah kesihatan walaupun data saintifik berkenaan khasiat dan bahan aktif produk ini sangat kurang. Kajian ini dijalankan untuk menganalisis nilai nutrisi, kandungan polifenol (TPC), anti-oksidan dan anti-mikrob produk kuda laut yang terdapat di pasaran tempatan untuk menyokong kepercayaan terhadap faedah kesihatannya. Kandungan lembapan, lipid mentah, protein mentah dan abu mentah ditentukan dengan kaedah piawai (AOAC 1990). TPC dinilai dengan kaedah Folin-Ciocalteu's, manakala aktiviti anti-oksidan ditentukan dengan dua kaedah yang berlainan: *scavenging 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radicals* dan *ferric reducing ability plasma (FRAP) assays*. Kandungan anti-mikrob ekstrak *Hippocampus barbouri* dinilai dengan menggunakan kaedah *disc diffusion*. Kandungan protein mentah, lipid mentah, abu mentah dan kelembapan (% berat kering) menjulat masing-masing dari 58 – 69%, 0.6 – 5.2%, 18.7 – 26.8% and 14.6 – 19.0%. Sampel kawalan (kuda laut hidup) menunjukkan kandungan protein yang lebih tinggi secara signifikan ($P < 0.05$) berbanding produk kering. Kuda laut jantan cenderung untuk mengandungi kandungan lipid yang lebih rendah tetapi abu yang lebih tinggi daripada betina. Faktor-faktor seperti kesegaran dan saiz kuda laut mungkin mempengaruhi komposisi proksimat. Kandungan TPC ekstrak *H. barbouri* menjulat dari 2.99 to 5.00 mg GAE/g. Keupayaan penurunan DPPH paling kuat dalam ekstrak methanol dan paling lemah di dalam ekstrak etil asetat. Manakala kandungan anti-oksidan *H. barbouri* di dalam ekstrak ethanol adalah lebih rendah daripada ekstrak etil asetat dan metanol. Nilai esei TPC, DPPH dan FRAP menunjukkan kewujudan hubungan negatif yang signifikan di antara esei DPPH dan FRAP ($r = 0.909$, $p < 0.01$). Hanya ekstrak *H. barbouri* jantan menggunakan etil asetat menunjukkan aktiviti anti-mikrob terhadap baka bakteria berbahaya. Keputusan yang diperolehi dari kajian ini adalah penting dalam usaha untuk memulihara spesies ini dan menggalakkan akuakultur kuda laut.