

RINGKASAN

MERLIN SEPTIANA BR SIHITE. Analisis Tingkat Pemanfaatan Sumber Daya Kepiting Bakau (*Scylla* Sp.) di Perairan Tanjung Piayu, Kota Batam. Dibimbing oleh AHMAD ZAHID dan SUSIANA.

Kepiting bakau (*Scylla* sp.) merupakan komoditas perikanan bernilai ekonomi tinggi yang menjadi salah satu sumber pendapatan utama masyarakat pesisir di Perairan Tanjung Piayu, Kota Batam. Aktivitas penangkapan yang belum sepenuhnya menerapkan prinsip keberlanjutan, terutama terkait ukuran minimum tangkap dan selektivitas alat tangkap, berpotensi menurunkan populasi kepiting bakau secara signifikan. Penelitian ini bertujuan untuk menentukan rasio jenis kelamin, menganalisis distribusi ukuran, serta menentukan dan mengevaluasi tingkat pemanfaatan kepiting bakau di Perairan Tanjung Piayu terhadap batas lestari. Penelitian dilaksanakan pada bulan Februari–April 2026 menggunakan metode survei berbasis hasil tangkapan nelayan (*fisher-based survey*) dengan teknik *purposive sampling*. Data dianalisis secara deskriptif dan kuantitatif menggunakan perangkat lunak FiSAT II, meliputi uji *chi-square*, analisis kohort metode Bhattacharya, kurva pertumbuhan Von Bertalanffy, serta perhitungan mortalitas dan tingkat eksploitasi berdasarkan metode Pauly. Hasil penelitian menunjukkan bahwa dari 1.633 ekor kepiting bakau yang tertangkap, 641 ekor (39,3%) jantan dan 992 ekor (60,7%) betina, dengan rasio 1:1,55 yang berbeda nyata dari kondisi seimbang (χ^2 hitung 75,44 > χ^2 tabel 3,84), mengindikasikan dominasi individu betina. Lebar karapas jantan berkisar 67,3–147,3 mm dan betina 65,1–155,1 mm, dengan frekuensi tertinggi pada kelas ukuran 90–105 mm. Analisis kohort metode Bhattacharya menunjukkan populasi jantan maupun betina secara konsisten terpisah menjadi dua kelompok umur pada setiap bulan pengamatan (*Separation Index* > 2,0), dengan kohort muda (rata-rata 92,4–98,2 mm) lebih dominan dibandingkan kohort tua (122,1–136,0 mm) dan bergeser ke ukuran lebih besar dari Februari ke April, mengindikasikan pertumbuhan aktif dan rekrutmen individu baru yang berkelanjutan. Analisis mortalitas dengan *Length-Converted Catch Curve* menghasilkan mortalitas total (Z), mortalitas alami (M), dan mortalitas penangkapan (F) berturut-turut sebesar 1,50, 0,72, dan 0,78 per tahun pada jantan; 4,17, 1,02, dan 3,15 per tahun pada betina; serta 3,46, 0,71, dan 2,75 per tahun pada gabungan. Nilai F yang jauh melampaui M, terutama pada betina, mengindikasikan bahwa kematian kepiting bakau lebih banyak disebabkan oleh aktivitas penangkapan daripada faktor alami. Tingkat eksploitasi (E) kepiting jantan sebesar 0,52 (tergolong *fully exploited*), sedangkan betina 0,75 dan gabungan 0,80 (keduanya *over exploited*), yang melampaui ambang eksploitasi optimum ($E \approx 0,50$). Hasil ini menunjukkan bahwa sumber daya kepiting bakau di Perairan Tanjung Piayu telah mengalami tangkap lebih (*overfishing*), terutama pada populasi betina, sehingga memerlukan langkah pengelolaan segera, seperti penetapan ukuran minimum tangkap, pengendalian upaya penangkapan yang mempertimbangkan perbedaan tekanan eksploitasi antarjenis kelamin, serta perlindungan dan rehabilitasi habitat mangrove, guna menjaga keberlanjutan sumber daya kepiting bakau di Perairan Tanjung Piayu.

Kata kunci: Eksploitasi, Kepiting Bakau, Rasio Kelamin, Tanjung Piayu

SUMMARY

MERLIN SEPTIANA BR SIHITE. Analysis of the Utilization Level of Mud Crab (*Scylla* sp.) Resources in the Waters of Tanjung Piayu, Batam City. Supervised by AHMAD ZAHID and SUSIANA.

Mud crabs (*Scylla* sp.) are a high-value fishery commodity serving as a primary source of income for coastal communities in the waters of Tanjung Piayu, Batam City. Fishing activities that do not fully adhere to sustainability principles, particularly regarding minimum catch sizes and gear selectivity, pose a significant risk of depleting mud crab populations. This study aimed to determine the sex ratio, analyze size distribution, and evaluate the utilization level of mud crabs in Tanjung Piayu waters relative to sustainable limits. The research was conducted from February to April 2026 using a *fisher-based survey* method and *purposive sampling*. Data were analyzed both descriptively and quantitatively using FiSAT II software, incorporating *chi-square* tests, Bhattacharya's cohort analysis, Von Bertalanffy growth curves, and calculations of mortality and exploitation rates based on Pauly's method. Results showed that among the 1,633 mud crabs caught, 641 (39.3%) were male and 992 (60.7%) were female, yielding a sex ratio of 1:1.55—a figure that differed significantly from a balanced ratio (calculated χ^2 75.44 > table χ^2 3.84), indicating female dominance. Carapace widths ranged from 67.3–147.3 mm for males and 65.1–155.1 mm for females, with the highest frequency in the 90–105 mm size class. Bhattacharya's cohort analysis showed that both male and female populations were consistently separated into two age groups each month (*Separation Index* > 2.0), with the younger cohort (mean 92.4–98.2 mm) more dominant than the older cohort (122.1–136.0 mm) and shifting toward larger sizes from February to April, indicating active growth and ongoing recruitment. Mortality analysis using the *Length-Converted Catch Curve* yielded total mortality (Z), natural mortality (M), and fishing mortality (F) of 1.50, 0.72, and 0.78 year⁻¹ for males; 4.17, 1.02, and 3.15 year⁻¹ for females; and 3.46, 0.71, and 2.75 year⁻¹ for the combined population, respectively. The fact that F far exceeded M, especially in females, indicates that mud crab mortality was driven more by fishing activity than by natural causes. The exploitation rate (E) for male mud crabs was 0.52 (*fully exploited*), whereas it was 0.75 for females and 0.80 for the combined population (both *overexploited*), exceeding the optimum exploitation threshold ($E \approx 0.50$). These results indicate that the mud crab resource in the waters of Tanjung Piayu is experiencing overfishing, particularly within the female population, necessitating immediate management measures—such as establishing minimum catch sizes, controlling fishing effort while accounting for the differing exploitation pressure between sexes, and protecting and rehabilitating mangrove habitats—to ensure the sustainability of the mud crab resource in the waters of Tanjung Piayu.

Keywords: Exploitation, Mud Crab, Sex Ratio, Tanjung Piayu