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Application of Point-Centered Quarter Method for Measurement The Beach Crab (*Ocypode* spp) Density

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ABSTRAK

Metoda Titik Perempatan adalah metoda analisis data untuk penentuan struktur horizontal pada vegetasi tumbuhan. Metoda ini didasarkan pada jarak empat buah pohon yang terdekat ke titik pusat di empat kuadran sampling. Untuk komunitas tumbuhan, metoda ini dikenal efisien dan mudah dikerjakan. Dalam hal fenomena sebaran lbang kepiting pinghgir pantai yang relative horizontal, maka metoda ini diperkirakan dapat pula diaplikasikan. Percobaan penggunaan metoda titik perempatan untuk kepiting pantai (*Ocypode spp)* telah dilakukan pantai Padang, pada 22 Desember 2014. Sepuluh titik sistematis dibuat di pantai lalu pada setiap titik dibuat empat kuadran. Jarak lubang Ocypode sp terdekat diukur dengan meteran. Perhitungan dari jarak rata-rata ke titik untuk 20 sampel kuadran menemukan jarak-rata rata 0,41 m dan populasi kepiting Ocypode 59.488,34 individu untuk seluas satu hektar. Populasi ini jauh lebih tinggi ketimbang jenis Schylla yang didapatkan oleh peneliti lain.

Kata Kunci: Metode titik perempatan, *Ocypode* sp, kepadatan

ABSTRACT

Point Quarter Method is a plant community structure measurement procedure. The technique is base on measurement of distance of four plants or trees in every quarter that is made by four space in the cross line sampling field studies. In forest sampling, point centered quarter methods is considered as the efficient, reliable and accurate data, not only for mean distance and density, but for frequency and dominance of species. So it is important to try wether these method ould be applicated to animal, especially crab. These method was applicated for crab population in Padang Beach at December 22nd, 2014. Ten points quartered were made and the distance of every *Ocypode* sp crab burrow was counted by ruler. Mean distance of crabs burrow gained by divided of total number of quarter (20) with mean distance of every burrow to the point. Density per hectare is 10,000 m divided by quadratic of mean distance. Mean distance of burrow to points were counted and prediction of population per hectare could be found. In these case, mean distance was: 0.41 m and crab population is :59,488.34 individu per hectare. Compared to other species , eg *Scylla serrata*, its population is bigger, eventhough the condition of beach is polluted and wasted

Keywords: point centered quarter method, *Ocypode* sp, density

INTRODUCTION

Point-Centered Quarter Method is a plant community structure measurement procedure. The technique is base on measurement of distance of four plants or trees in every quarter that is made by four space in the cross line sampling field studies. According to Mueler-Dumbois and Ellenberg (1974), four quarters are established at the sampling point through a cross formed by two lines; where one line is the compass direction and second line running perpendicular to the compass direction through the sampling point. These line – cross could be also randomly established by spinning a cross over of aech sampling point. Distances to the midpoint of the nearest tree or in these case, burrow, from the sampling is measured in each quarter.

Study on crab population, *Scylla serrata*, had been done by Ansori (2014) in mangrove forest, at north coast of Pemalang, which used the 1 m^2 plot in three replication of 5 types habitat. The highest population found at medial zone of mangrove (5583.33 individu per hectare) and lowest population prsent at distal zone. It is stated that salinity and dissolved oxygen were the factor that influence population density. Pratiwi (2007) and Wulandari et al. (2013) were use the 1 m^2 plots for their investigation on crabs population too. Population and diversity of crabs, were influenced by biogeographic differences united temperature and other factor (Levinton and Mackie, 2013) and Indonesian coast become the habitat of some species namely *Ocypode cerathophtalma, O cordimanus*, *O kuhlii* and *O pallidula* (Anonymous, 2013). Three species of *Uca,* were found Tanjung Jabung Barat, Jambi; *Uca forcipata*, *Uca rosea* and *Uca dussumieri* (Wulandari et al., 2013).

Pantai Lolong Belanti or Lolong Belanti Beach, Padang City, is placed about 3 km from city center (Pic 1). This beach become tourist destination and many peoples come for spent their time here especially at afternoon. Food shops are exist at the street along the coast and peoples behavior in the city influence the waste number, included at sandy beach. Ocypode, and may be Uca too, were the crabs that survive to live on those habitat. Many fiddler crabs burrow exist on sandy beach and could be used as object for application of point centered quarter method, while no overlap of burrow and each burrow belong to one crab.

Figure 1. Lolong Belanti Beach, Padang.

MATERIALS AND METHODS

These method was applicated for crab population in Padang Beach at December 22nd, 2014. Ten points quartered were made and the distance of every *Ocypode* sp crab burrow was counted by ruler

Figure 2. Point Centered Quarter with crabs burrow distance measurement

Mean distance of crabs burrow gained by divided of total number of quarter (20) with mean distance of every burrow to the point. Density per hectare is 10,000 m divided by quadratic of mean distance.

RESULT AND DISCUSSION

Measurement of burrows distance to 10 ponts sampling are present in table 1.

Table 1 Shows the distances of every four burrows at ten points made at Lolong Belanti Beach, Padang, 22 December 2014. (m)

POINT 1	QUARTER 1	0.30	POINT 6	QUARTER 1	0.25
	2	0.10		2	0.20
	3	0.20		3	0.40
	4	0.60		4	0.55
POINT 2	QUARTER 1	0.35	POINT 7	QUARTER 1	0.65
	2	0.10		2	0.40
	3	0.20		3	0.50
	4	0.85		4	0.20
POINT 3	QUARTER 1	0.55	POINT 8	QUARTER 1	0.15
	2	0.70		2	0.25
	3	0.25		3	0.30
	4	0.75		4	0.40
POINT 4	QUARTER 1	0.20	POINT 9	QUARTER 1	0.75
	2	0.40		2	0.60
	3	0.25		3	0.60
	4	0.60		4	0.40
POINT 5	QUARTER 1	0.80	POINT 10	QUARTER 1	0.20
	2	0.30		2	0.40
	3	0.35		3	0.60
	4	0.10		4	0.65

Mean distance of burrow to points were counted and prediction of population per hectare could be found. In these case, mean distance was: 0.41 m and crab population is :59,488.34 individu per hectare. Compared to other species ,eg *Scylla serrata*, (Ansori, 2014) its population is bigger, eventhough the condition of beach is polluted and wasted. In Pakistan, Yousuf et al., (2007) found *Ocypode ceratophtalma, O gaudichaudii, O macleayana*, and O *rotundata.*

In forest sampling, point centered quarter methods is considered as the efficient, reliable and accurate data, not only for mean distance and density, but for frequency and dominance of species (May and Penfound, 1967).Even the data of mean basal area could be taken by this method as publicated by Mark and Esler (1970). For further investigation, the width of crabs burrow should consider

as the parameter measurement. According to Tureli et al., (2009), burrow diameter have the relationship with crabs size, and furthermore, with the species of crabs.

Figure 3. *Ocypode* sp, and crab size be compared with hand.

CONCLUSION

In these case, mean distance was: 0.41 m and crab population is :59,488.34 individu per hectare. Compared to other species , eg *Scylla serrata*, its population is bigger, eventhough the condition of beach is polluted and wasted. Point centered quarter method could be used for burrow-crabs population measurement.

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