

Coral larvae spreading based on oceanographic condition in Biawak Islands, West Java, Indonesia

CANDRA A. FITRIADI^{1,✉}, YAYAT DHAHIYAT², NOIR P. PURBA^{3,✉}, SYAWALUDIN A. HARAHAP¹,
DONNY J. PRIHADI¹

¹ Department of Marine Science, Faculty of Fisheries and Marine Science, Universitas Padjadjaran. Ged. Dekanat FPIK-UNPAD, Kampus Jatinangor, Jl. Raya Bandung-Sumedang Km 21, Jatinangor, Sumedang 45363, West Java, Indonesia. Tel.: +62-22-87701519, Fax.: +62-22-87701519, ✉email: candraaf@gmail.com

² Department of Fisheries Management, Faculty of Fisheries and Marine Science, Universitas Padjadjaran. Ged. Dekanat FPIK-UNPAD, Kampus Jatinangor, Jl. Raya Bandung-Sumedang Km 21, Jatinangor, Sumedang 45363, West Java, Indonesia

³ KOMITMEN Research Group, Universitas Padjadjaran. Ged. Dekanat FPIK-UNPAD, Kampus Jatinangor, Jl. Raya Bandung-Sumedang Km 21, Jatinangor, Sumedang 45363, West Java, Indonesia. ✉email: noirpurba@gmail.com.

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Abstract. Fitriadi CA, Dhahiyat Y, Purba NP, Harahap SA, Prihadi DJ. 2017. *Coral larvae recruitment based on oceanography condition in Biawak Islands, West Java, Indonesia. Biodiversitas 18: 681-688.* This research aimed to know the recruitment pattern of planula in the Biawak Island. The dispersion of planula and corals recruitment as an important factor to determine the distribution of the adult corals. The spawning and brooding are the beginning processes of planula dispersion. Dispersion factors are highly influenced by water environment factors. The main factor in planula dispersion is sea currents, wind, tide, and bathymetry. The circulation of sea currents on Biawak Islands waters is influenced by the tidal movement. The results of research showed that Biawak Islands waters have mixed tide prevailing semidiurnal type of tidal movement. Currents of Biawak Islands waters moved from the northern toward the southern with a range of speed between 0.045-0.075 m/s on northeast and south and for west and north range of speed of sea currents are between 0.015-0.195 m/s, the sea currents movement of Biawak Islands waters was dominated by tidal movement. Biawak Islands have varying wind speed, the most direction of wind moved to northwestern toward southeastern by predominance speed 4.8-7.2 m/s. The results of research showed that planula on the Biawak Island moved to northern and northeastern at high tide and then moved to southern and southeastern at a low ebb with the furthest movement of planula on the Biawak Island was 2.2 km. The furthest movement of planula on the Gosong Island was 1.66 km and planula dispersed to the east and west region of Gosong Island, on the Cendikia Island planula dispersed to northern and eastern with the furthest movement of planula on the Cendikia Island was 0.44 km. Based on the movement of planula can be concluded that source of coral reefs on the Gosong Island derived from the coral reefs on the Biawak Island.

Keywords: Planula, coral recruitment, currents, oceanography, Biawak Islands

Abbreviations: BIEXRE = Biawak Exploration and Research, TRAX = Technical Research and Expedition, MYSEA = Marine Bio-Ecology Spatial Mapping, PODC = Padjadjaran Oceanographic Data Centre, DIKTI = Pendidikan Tinggi, UNPAD = Universitas Padjadjaran, KOMITMEN = Kelompok Studi Instrumentasi dan Survei Kelautan, MPA = Marine Protected Areas .

INTRODUCTION

The coral reef is one of the complex ecosystems and formed from solid calcium carbonate (CaCO_3), which is produced by mutualism symbiosis and other organisms that secrete calcium carbonate. Coral reef lives on the coast or areas that have to expose to light because to produce photosynthesis. Generally, corals reproduce in two ways: asexual and sexual. In sexual reproduction, ocean currents play an important role in the fertilization process, especially during spawning and planula phase (Richmond 1987; Roberts 1997).

In the spawning process, corals release ovum and sperm into the water column and began fertilization process in a few hours. The next step is planula floats and via ocean currents find a suitable substrate. The recruitment process means that planula will be attached to the substrate that is eligible to support growth. This mechanism is an important principle in maintaining and multiplying the adult

populations of marine organisms (Underwood and Fairweather 1989; Hughes et al. 2000; Harii and Kayanne 2001). Planula will attach to the substrate of about 4 to 7 days after fertilization (Babcock and Heyward 1986; Harrison and Wallace 1990), the range of planula's maximum resistance is 26 to 78 days (Lugo-Fernandes 2001) and depends on physical and chemical stress including the ocean currents (Morgan 1995). Currents not only spread the planula, but more function is to support oxygen, food, the warm water for the manufacture of coral (Wood 1983). Currents is the movement of water resulting in the horizontal and vertical displacement of water masses and via atmosphere transfer the energy (Sverdrup et al. 1961).

This research focuses on spreading of planula in Biawak Islands, Indramayu region. Biawak consists of 3 islands and locates in Java Seas. Ocean currents play important role in this area affected by tides and monsoon (Siregar et al. 2017). This research focuses on the process of recruitment and will describe the main point of the three