

ABSTRAK

Actinobacteria merupakan salah satu kelompok bakteri yang dapat ditemukan di lingkungan tanah non-terestrial seperti sedimen hutan mangrove. Actinobacteria memiliki potensi sebagai penghasil senyawa antibakteri dan enzim. Penelitian ini bertujuan untuk menemukan isolat murni bakteri Actinobacteria dari sedimen mangrove pesisir Madura serta yang berpotensi sebagai antibakteri dan aktivitas enzim hidrolase. Kegiatan isolasi Actinobacteria yang berasal dari sedimen rizosfer mangrove Labuhan, Madura dilakukan pada media *International Streptomyces Project* (ISP) 2 dengan menggunakan metode *spread plate*. Karakterisasi Actinobacteria terdiri dari karakterisasi makroskopik dan mikroskopik. Pengujian aktivitas antibakteri dilakukan pada bakteri *Staphylococcus aureus* menggunakan metode *agar plug*. Skrining enzim hidrolase dilakukan menggunakan metode titik pada masing-masing media diantaranya enzim protease (ISP 2 ditambah 1% skim milk), enzim amilase (ISP 2 ditambah 1% pati), enzim lipase (ISP 2 ditambah 1% *tween 80*). Sebanyak 13 isolat Actinobacteria berhasil diisolasi dari sedimen mangrove Labuhan, Madura. Ketiga belas isolat memiliki bentuk koloni bulat dan Irreguler; memiliki elevasi koloni *convex*, *umbonate*, *raised*, dan *flat*; memiliki pinggir koloni *entire*, *filamentous*, *entire*, *undulate*, dan *lobate*. Warna permukaan dan warna sebalik isolat Actinobacteria yang didapatkan berwarna krem dan putih. Ketiga belas isolat tergolong bakteri Gram positif dengan bentuk basil dan coccus. Isolat Actinobacteria tersebut memiliki zona hambat pada inkubasi 24 jam berkategori lemah dan kuat dengan nilai sebesar 2,55-14,04 mm, pada inkubasi 48 jam berkategori lemah-sedang dengan nilai sebesar 2,55-7,64 mm dan inkubasi 72 jam berkategori lemah-sedang dengan nilai sebesar 1,50-7,16 mm. Selain itu, Isolat Actinobacteria yang berhasil diisolasi dari sedimen mangrove Labuhan, Madura memiliki aktivitas enzim protease sebanyak 10 isolat, isolat yang memiliki aktivitas enzim amilase sebanyak 5 isolat, dan isolat yang memiliki aktivitas enzim lipase sebanyak 8 isolat.

Kata kunci : Rizosfer, Agar plug, Protease, Amilase, Lipase

ABSTRACT

Actinobacteria is a group of bacteria that can be found in non-terrestrial soil environments such as mangrove forest sediments. Actinobacteria have the potential to produce antibacterial compounds and enzymes. This study aims to find pure isolate of Actinobacteria bacteria from the sediments of coastal mangroves of Madura as well as those that have the potential as antibacterial and hydrolase enzyme activity. The isolation activity of Actinobacteria originating from the rhizosphere sediment of the Labuhan mangrove, Madura was carried out on the International Streptomyces Project (ISP) 2 media using the spread plate method. Actinobacteria characterization consists of macroscopic and microscopic characterization. Antibacterial activity testing was carried out on *Staphylococcus aureus* bacteria using the method of plug hydrolase enzyme screening was carried out using the point method on each medium including protease enzyme (ISP 2 + 1% skim milk), amylase enzyme (ISP 2 + 1% starch), lipase enzyme (ISP 2 + 1% tween 80). A total of 13 Actinobacteria isolates were successfully isolated from the sediments of the Labuhan mangrove, Madura. The thirteen isolates have a round and irregular colony shape; has the elevation of convex, umbonate, raised, and flat colonies; It has the edges of the colonies of entire, filamentous, entire, undulate, and lobate. The surface color and the color behind the Actinobacteria isolate obtained are beige and white. Thirteen isolates belong to Gram-positive bacteria in the form of bacilli and coccus. The Actinobacteria isolate had an inhibition zone in the 24-hour incubation category of weak and strong with a value of 2.55-14.04 mm, in the 48-hour incubation category of weak-medium with a value of 2.55-7.64 mm and a 72-hour incubation in the weak-medium category with a value of 1.50-7.16 mm. In addition, Actinobacteria isolate that was successfully isolated from the sediment of the Labuhan mangrove, Madura has 10 isolates of protease enzyme activity, 5 isolates of amylase enzyme activity, and 8 isolates of lipase enzyme activity.

Keywords: *Rhizosphere, Agar plug, Protease, Amylase, Lipase*