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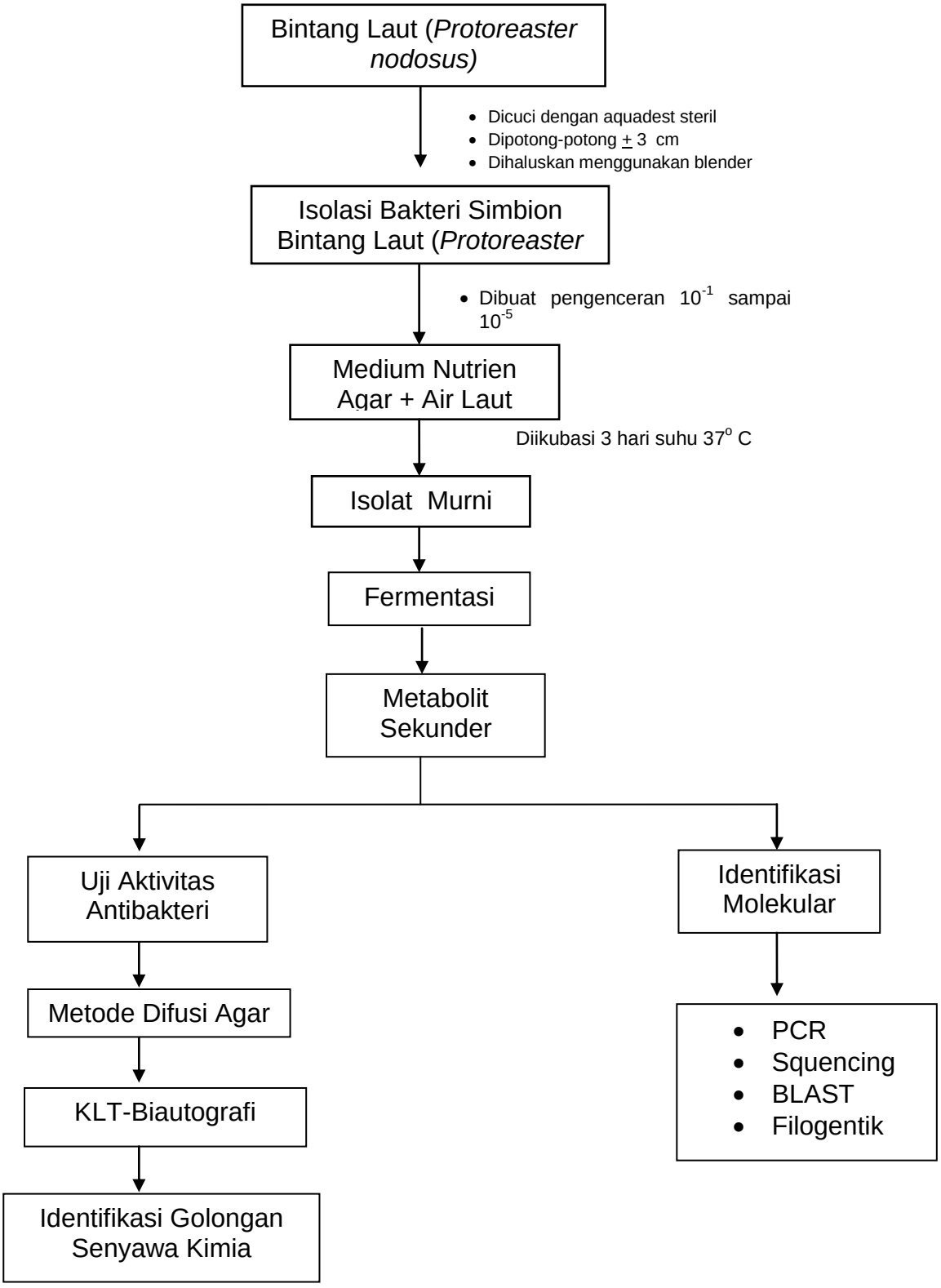
LAMPIRAN

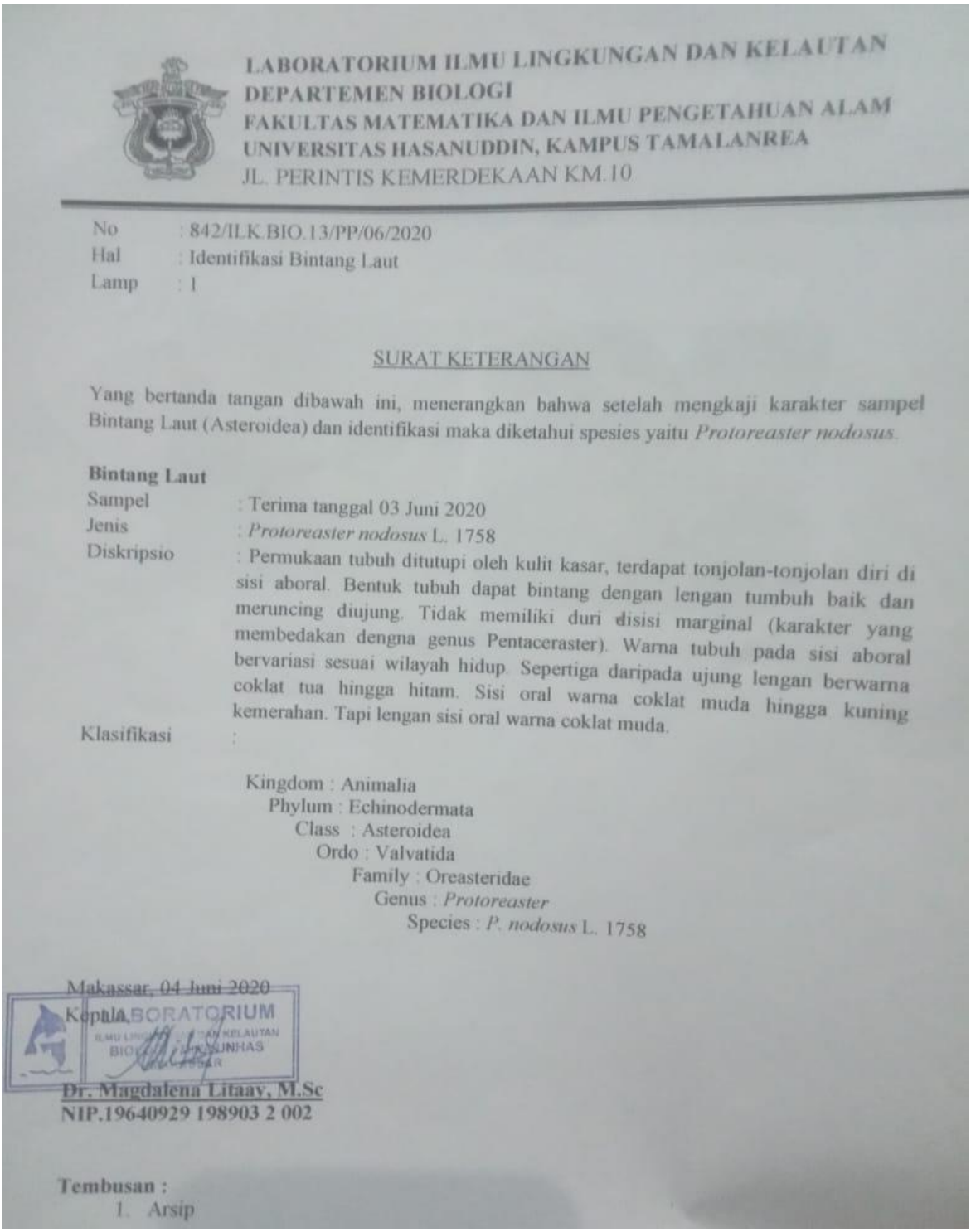
Lampiran 1. Skema kerja



Lampiran 2. Sampel Penelitian

Gambar 13. Foto sampel bintang laut (*Protoreaster nodosus)*

Lampiran 3. Identifikasi Bintang laut



LABORATORIUM ILMU LINGKUNGAN DAN KELAUTAN
DEPARTEMEN BIOLOGI
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS HASANUDDIN, KAMPUS TAMALANREA
JL. PERINTIS KEMERDEKAAN KM.10

No : 842/ILK.BIO.13/PP/06/2020
Hal : Identifikasi Bintang Laut
Lamp : 1

SURAT KETERANGAN

Yang bertanda tangan dibawah ini, menerangkan bahwa setelah mengkaji karakter sampel Bintang Laut (Asteroidea) dan identifikasi maka diketahui spesies yaitu *Protoreaster nodosus*.

Bintang Laut
Sampel : Terima tanggal 03 Juni 2020
Jenis : *Protoreaster nodosus* L. 1758
Diskripsio : Permukaan tubuh ditutupi oleh kulit kasar, terdapat tonjolan-tonjolan diri di sisi aboral. Bentuk tubuh dapat bintang dengan lengan tumbuh baik dan meruncing diujung. Tidak memiliki duri disisi marginal (karakter yang membedakan dengna genus Pentaceraster). Warna tubuh pada sisi aboral bervariasi sesuai wilayah hidup. Sepertiga daripada ujung lengan berwarna coklat tua hingga hitam. Sisi oral warna coklat muda hingga kuning kemerahan. Tapi lengan sisi oral warna coklat muda.
Klasifikasi :

Kingdom : Animalia
Phylum : Echinodermata
Class : Asteroidea
Ordo : Valvatida
Family : Oreasteridae
Genus : *Protoreaster*
Species : *P. nodosus* L. 1758

Makassar, 04 Juni 2020
Kepala,
LABORATORIUM ILMU LINGKUNGAN DAN KELAUTAN BIOLOGI UNHAS MAKASSAR
Dr. Magdalena Litaay, M.Sc
NIP.19640929 198903 2 002

Tembusan :
1. Arsip

Gambar 14. Hasil Identifikasi Sampel Bintrang laut (*Protoreaster nodosus).*

Lampiran 4. Dokumentasi Penelitian

GAAAANCTTGCTCTTATGAAGTTAGCGGCGGACGGGTGAGTAACACG
TGGGTAACCTGCCCATAAGACTGGGATAACTCCGGGAAACCGGGGC
AAATACCGGATAACATTTTGAACCGCATGGTTCGAAATTGAAAGGCG
GCTTCGGCTGTCACTAATGAATGGACCCGCGTCACATTAGCAAGTTG
CTGAGGTAACGGCTCACCAAGGCATCTATGCGTTCCCGACCAACACT
CCCCACCCTATGACTCTGTACCTATGCCCTGGTCATTTATTTTCTCAC
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CCTTTCCTCAGAAATACGTATCGAAACATCATATAAGATTTNNACATGT
GACTTCTCCTTCCCAATATTTCTTTTCGTAGAGCTGCCCCTGTGTCTC
ATCTNTTATTAACTCCATCTGCTTTGTGAGACATGTNTTCTCTGCCTCT
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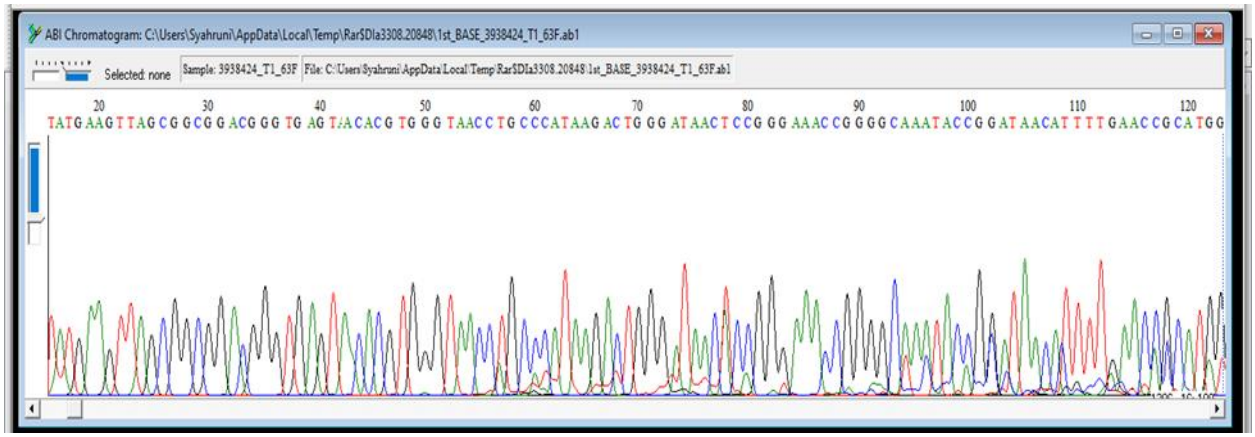
https://blast.ncbi.nlm.nih.gov/Blast.cgi



Gambar 15. Hasil Kromatogram DNA Squencing Isolat bakteri simbion bintang laut (*Protoreaster nodusosu)* dengan kode isolat BS 1T.

AAGGGNNCTTGCTCCTGATGTTAGCGGCGGACGGGTGAGTAACACG
TGGGTAACCTGCCTGTAAGACTGGGATAACTCCGGGAAACCGGGGC
TAATACCGGATGCTTGTTTGAACCGCATGGTTCAAACATAAAAGGTGG
CTTCGGCTACCACTTACAGATGGACCCGCGGCGCATTAGCTAGTTGG
TGAGGTAACGGCTCACCAAGGCGACGATGCGTAGCCGACCTGAGAG
GGTGATCGGCCACACTGGGACTGAGACACGGCCCAGACTCCTACGG
GAGGCAGCAGTAGGGAATCTTCCGCAATGGACGAAAGTCTGACGGA
GCAACGCCGCGTGAGTGATGAAGGTTTTCGGATCGTAAAGCTCTGTT
GTTAGGGAAGAACAAGTGCCGTTCAAATAGGGCGGCACCTTGACGG
TACCTAACCAGAAAGCCACGGCTAACTACGTGCCAGCAGCCGCGGT
AATACGTAGGTGGCAAGCGTTGTCCGGAATTATTGGGCGTAAAGGGC
TCGCAGGCGGTTTCTTAAGTCTGATGTGAAAGCCCCCGGCTCAACCG
GGGAGGGTCATTGGAAACTGGGGAACTTGAGTGCAGAAGAGGAGAG
TGGAATTCCACGTGTAGCGGTGAAATGCGTAGAGATGTGGAGGAACA
CCAGTGGCGAAGGCGACTCTCTGGTCTGTAACTGACGCTGAGGAGC
GAAAGCGTGGGGAGCGAACAGGATTAGATACCCTGGTAGTCCACGC
CGTAAACGATGAGTGCTAAGTGTTAGGGGGTTTCCGCCCCTTAGTGC
TGCAGCTAACGCATTAAGCACTCCGCCTGGGGAGTACGGTCGCAAG
ACTGAAACTCAGAGGAATTGACGGGGGCGCGCACAAGCGGTGGAGC
ATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGTCTTGAC
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AATGNCTTAACNNAGGCANGAAACCGGGAGGTAAACCATTCCCAAAT
CTTTCTCATTTNATCCAATTTCCAATGAA

https://blast.ncbi.nlm.nih.gov/Blast.cgi

Gambar 16. Hasil Kromatogram DNA Squencing Isolat bakteri simbion bintang laut (Protoreaster nodusosu) dengan kode isolat BS 2T.

AAAGCTTGCTCTCGGGTGACGAGCGGCGGACGGGTGAGTAATGTCTGGGA
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CCCAGATGGGATTAGCTAGTAGGTGGGGTAACGGCTCACCTAGGCGACGAT
CCCTAGCTGGTCTGAGAGGATGACCAGCCACACTGGAACTGAGACACGGTC
CAGACTCCTACGGGAGGCAGCAGTGGGGAATATTGCACAATGGGCGCAAG
CCTGATGCAGCCATGCCGCGTGTGTGAAGAAGGCCTTCGGGTTGTAAAGCA
CTTTCAGCGGGGAGGAAGGCGTTAAGGTTAATAACCTTGGCGATTGACGTT
ACCCGCAGAAGAAGCACCGGCTAACTCCGTGCCAGCAGCCGCGGTAATAC
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GGTCTGTCAAGTCGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATT
CGAAACTGGCAGGCTAGAGTCTTGTAGAGGGGGGTAGAATTCCAGGTGTAG
CGGTGAAATGCGTAGAGATCTGGAGGAATACCGGTGGCGAAGGCGGCCCC
CTGGACAAAGACTGACGCTCAGGTGCGAAAGCGTGGGGAGCAAACAGGAT
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GACATCCACAGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACTGTGAG
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ACTCAAAGAGACTGCCAGTGATAAACTGGAGGAAGGTGGGGATGACGTCAA
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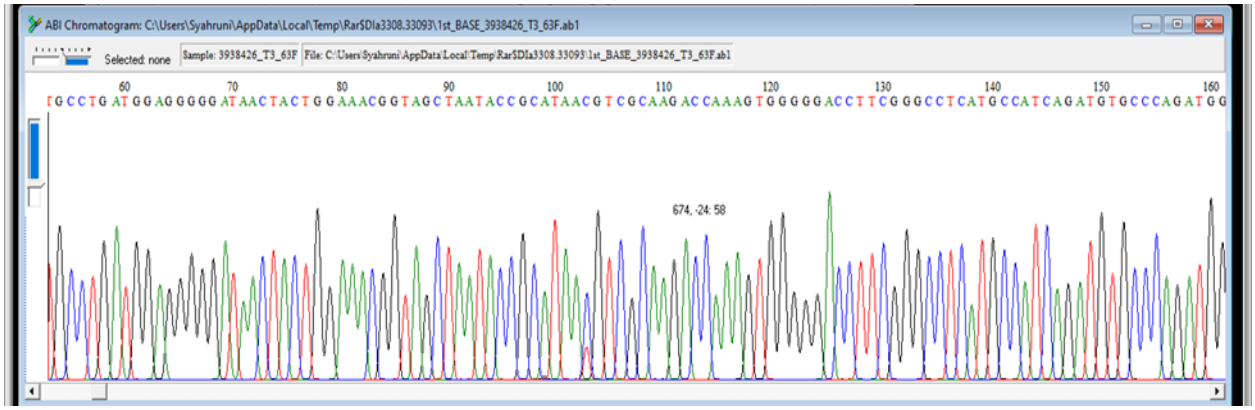
https://blast.ncbi.nlm.nih.gov/Blast.cgi



Gambar 17. Hasil Kromatogram DNA Squencing Isolat bakteri simbion bintang laut (Protoreaster nodusosu) dengan kode isolat BS 3T.

AAAGCTTGCTCTCGGGTGACGAGCGGCGGACGGGTGAGTAATGTCTGGGA
ACTGCCTGATGGAGGGGGATAACTACTGGAAACGGTAGCTAATACCGCATA
ACGTCGCAAGACCAAAGTGGGGGACCTTCGGGCCTCATGCCATCAGATGTG
CCCAGATGGGATTAGCTAGTAGGTGGGGTAACGGCTCACCTAGGCGACGAT
CCCTAGCTGGTCTGAGAGGATGACCAGCCACACTGGAACTGAGACACGGTC
CAGACTCCTACGGGAGGCAGCAGTGGGGAATATTGCACAATGGGCGCAAG
CCTGATGCAGCCATGCCGCGTGTGTGAAGAAGGCCTTCGGGTTGTAAAGCA
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ACCCGCAGAAGAAGCACCGGCTAACTCCGTGCCAGCAGCCGCGGTAATAC
GGAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCACGCAGGC
GGTCTGTCAAGTCGGATGTGAAATCCCCGGGCTCAACCTGGGAACTGCATT
CGAAACTGGCAGGCTAGAGTCTTGTAGAGGGGGGTAGAATTCCAGGTGTAG
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GACATCCACAGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACTGTGAG
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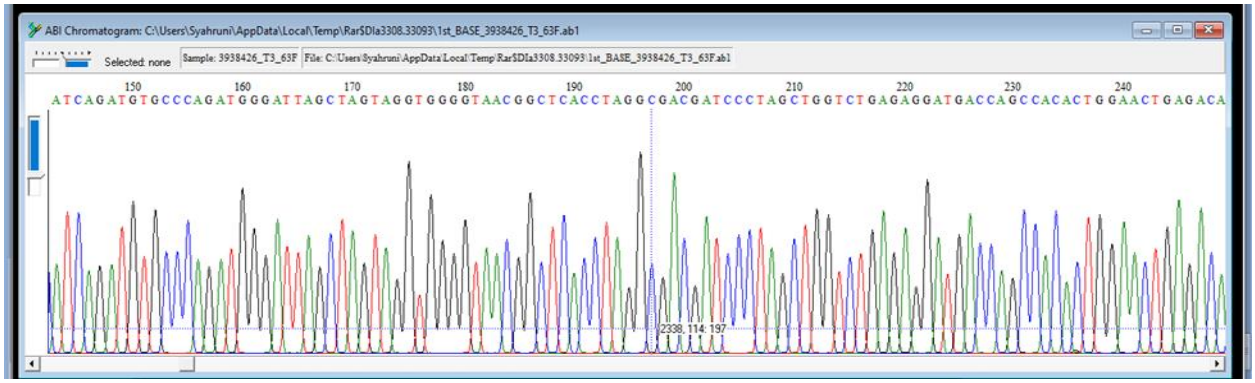


Gambar 18. Hasil Kromatogram DNA Squencing Isolat bakteri simbion bintang laut (Protoreaster nodusosu) dengan kode isolat BS 4T.

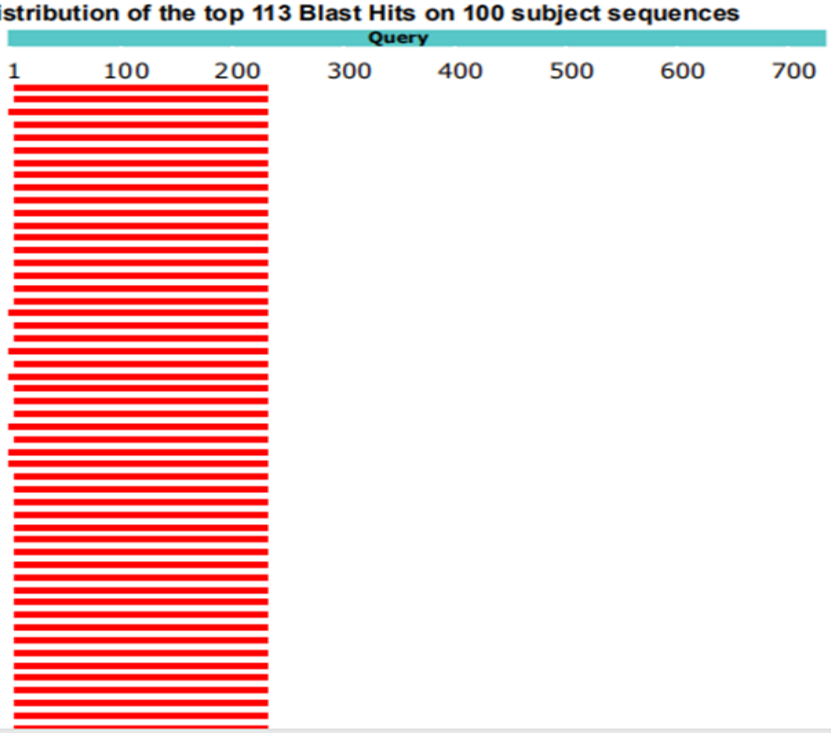
BLAST ® » **blastn suite** » results for RID-JZRAPW0V014

Job Title	Nucleotide Sequence ...
RID	JZRAPW0V014 Search expires on 08-10 19:26 pm
Program	BLASTN
Database	nt
Query ID	lcl|Query_27281
Description	None ...
Molecule type	dna
Query Length	726

Descriptions

Description	Max Score	Total Score	Query Cover	E value	Per. Ident	Accession
Bacillus sp. (in: Bacteria) strain 6PNA17 16S ribosomal RNA gene, partial sequence	361	361	30%	4e-95	95.95%	MN416317.1
Bacterium strain UKM-BCY1 16S ribosomal RNA gene, partial sequence	361	361	30%	4e-95	95.95%	MN148649.1
Bacillus sp. (in: Bacteria) strain PUP 27 16S ribosomal RNA gene, partial sequence	361	361	31%	4e-95	95.15%	MH223457.1
Bacillus cereus strain AB5-SW1 16S ribosomal RNA gene, partial sequence	361	361	30%	4e-95	95.95%	MG890216.1
Bacillus sp. strain Lgn-3 16S ribosomal RNA gene, partial sequence	361	361	30%	4e-95	95.95%	MG430377.1

Distribution of the top 113 Blast Hits on 100 subject sequences



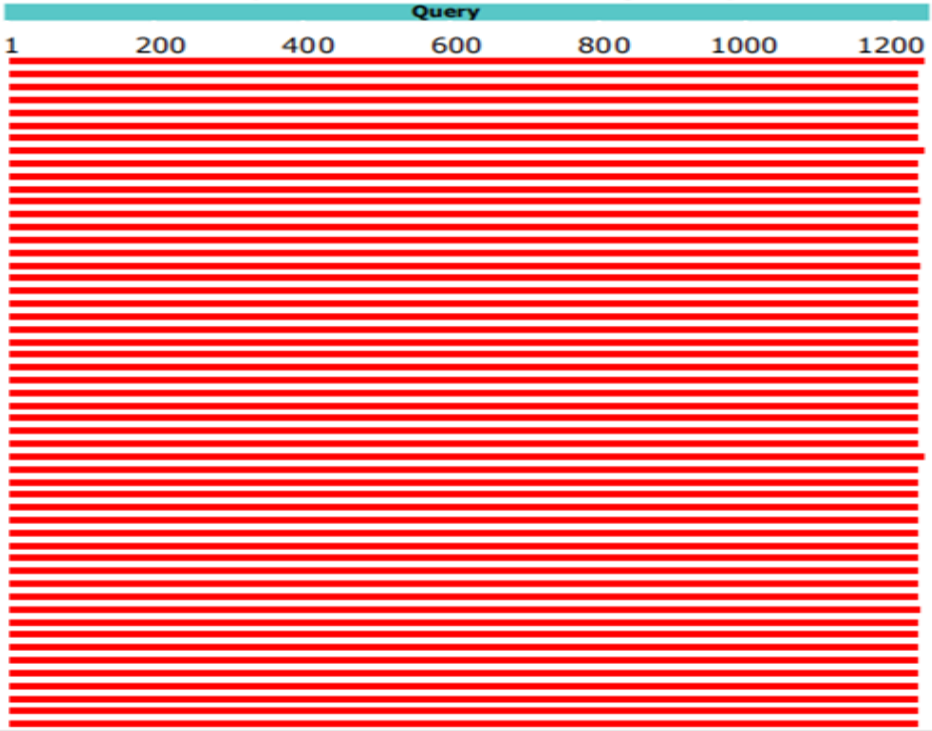
BLAST ® » **blastn suite** » results for RID-JZRHWN8X016

Job Title	Nucleotide Sequence ...
RID	JZRHWN8X016 Search expires on 08-10 19:30 pm
Program	BLASTN
Database	nt
Query ID	lcl|Query_24795
Description	None ...
Molecule type	dna
Query Length	1239

Descriptions

Description	Max Score	Total Score	Query Cover	E value	Per. Ident	Accession
Bacillus amyloliquefaciens strain 205 chromosome, complete genome	1984	17787	97%	0.0	95.68%	CP054415.1
Bacillus amyloliquefaciens strain RESI-50 16S ribosomal RNA gene, partial sequence	1984	1984	97%	0.0	95.68%	MT542326.1
Bacillus amyloliquefaciens strain 3820 16S ribosomal RNA gene, partial sequence	1984	1984	97%	0.0	95.68%	MT538668.1
Bacillus sp. (in: Bacteria) strain L111 16S ribosomal RNA gene, partial sequence	1984	1984	97%	0.0	95.68%	MT516445.1
Bacillus amyloliquefaciens strain SQ-2 16S ribosomal RNA gene, partial sequence	1984	1984	97%	0.0	95.68%	MN922942.1

Distribution of the top 182 Blast Hits on 100 subject sequences



Gambar 19. Data Hasil BLAST isolat bakteri simbion bintang laut (Protoreaster nodosus) kode isolat BS 2T melalui website Genbank Ncbi.

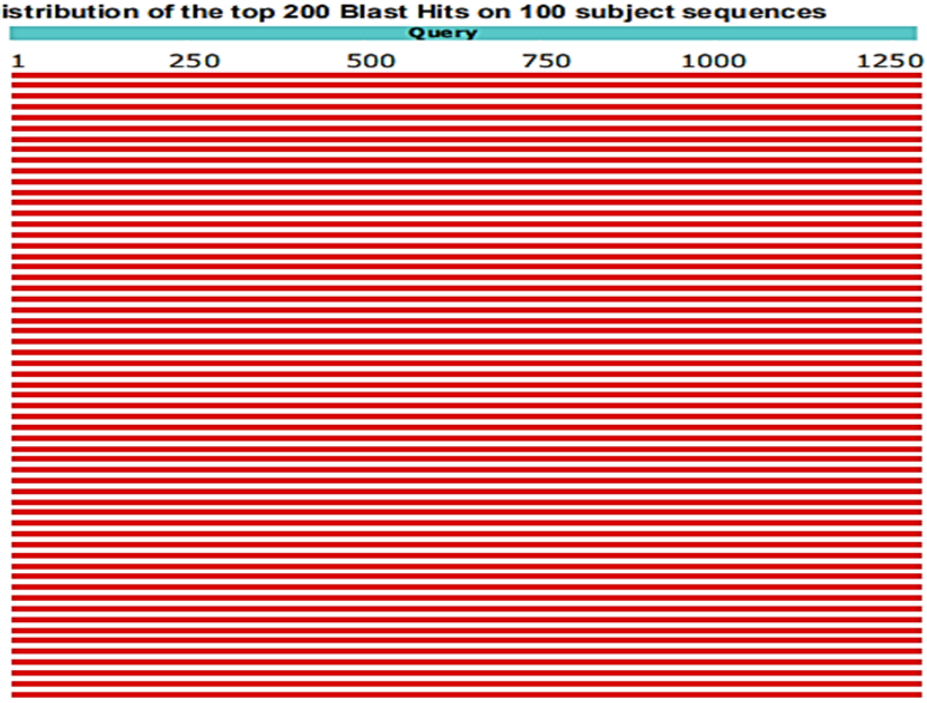
BLAST ® » **blastn suite** » results for RID-JZRPDFEP016

Job Title	Nucleotide Sequence ...
RID	JZRPDFEP016 Search expires on 08-10 19:32 pm
Program	BLASTN
Database	nt
Query ID	lcl|Query_49047
Description	None ...
Molecule type	dna
Query Length	1281

Descriptions

Description	Max Score	Total Score	Query Cover	E value	Per. Ident	Accession
Uncultured bacterium clone Ad_B1006 16S ribosomal RNA gene, partial sequence	2207	2207	99%	0.0	97.53%	KF841705.1
Klebsiella pneumoniae strain BA33875 chromosome, complete genome	2206	16977	99%	0.0	97.53%	CP035179.1
Klebsiella pneumoniae strain MS14393 chromosome, complete genome	2202	17446	99%	0.0	97.45%	CP054303.1
Klebsiella pneumoniae strain KP113E 16S ribosomal RNA gene, partial sequence	2202	2202	99%	0.0	97.45%	MT453829.1
Klebsiella pneumoniae strain F17KP0054 chromosome, complete genome	2202	17618	99%	0.0	97.45%	CP052136.1
Klebsiella pneumoniae strain C16KP0164 chromosome, complete genome	2202	17618	99%	0.0	97.45%	CP052422.1

Distribution of the top 200 Blast Hits on 100 subject sequences



Gambar 20. Data Hasil BLAST isolat bakteri simbion bintang laut (Protoreaster nodosus) kode isolat BS 3T melalui website Genbank Ncbi.

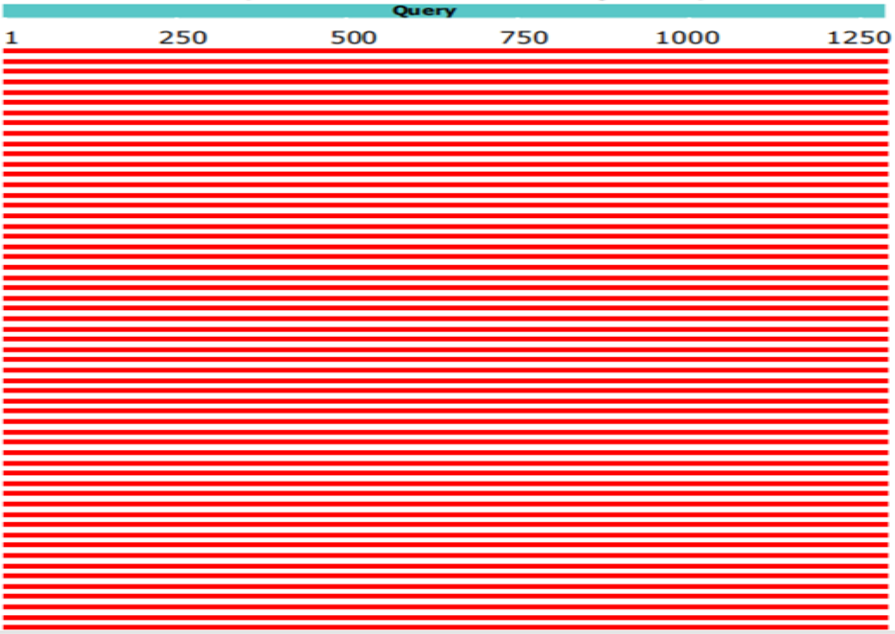
BLAST ® » blastn suite » results for RID-JZRPDFEP016

Job Title	Nucleotide Sequence ...
RID	JZRPDFEP016 Search expires on 08-10 19:32 pm
Program	BLASTN
Database	nt
Query ID	lcl|Query_49047
Description	None ...
Molecule type	dna
Query Length	1281

Descriptions

Description	Max Score	Total Score	Query Cover	E value	Per. Ident	Accession
Uncultured bacterium clone Ad_B1006 16S ribosomal RNA gene, partial sequence	2207	2207	99%	0.0	97.53%	KF841705.1
Klebsiella pneumoniae strain BA33875 chromosome, complete genome	2206	16977	99%	0.0	97.53%	CP035179.1
Klebsiella pneumoniae strain MS14393 chromosome, complete genome	2202	17446	99%	0.0	97.45%	CP054303.1
Klebsiella pneumoniae strain KP113E 16S ribosomal RNA gene, partial sequence	2202	2202	99%	0.0	97.45%	MT453829.1
Klebsiella pneumoniae strain F17KP0054 chromosome, complete genome	2202	17618	99%	0.0	97.45%	CP052136.1
Klebsiella pneumoniae strain C16KP0164 chromosome, complete genome	2202	17618	99%	0.0	97.45%	CP052422.1

Distribution of the top 200 Blast Hits on 100 subject sequences



Gambar 21. Data Hasil BLAST isolat bakteri simbion bintang laut (Protoreaster nodosus) kode isolat BS 4T melalui website Genbank Ncbi.