

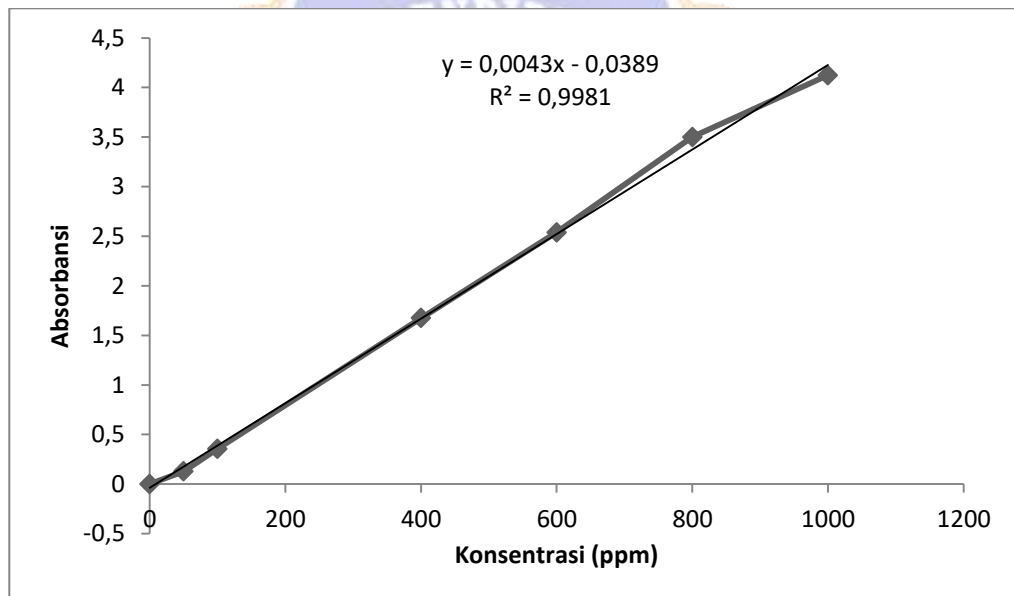


Lampiran 1. Data hasil pengukuran OD bakteri menggunakan spektrofotometer UV-Vis

| Waktu (jam) | Absorbansi pada 600 nm |
|-------------|------------------------|
| 0 | 0 |
| 3 | 0,45 |
| 6 | 0,85 |
| 8 | 0,995 |
| 9 | 1,045 |
| 10 | 1,495 |
| 11 | 1,335 |
| 12 | 1,11 |
| 13 | 1,125 |
| 14 | 1,16 |
| 15 | 1,195 |
| 16 | 1,125 |
| 17 | 1,215 |
| 18 | 1,305 |
| 19 | 1,295 |
| 20 | 1,29 |
| 21 | 1,45 |
| 22 | 1,4 |
| 23 | 1,49 |
| 24 | 1,19 |
| 25 | 1,32 |
| 26 | 1,3 |
| 27 | 1,345 |
| 28 | 1,485 |
| 29 | 1,54 |
| 30 | 1,64 |
| 31 | 1,76 |
| 32 | 1,785 |
| 33 | 2,16 |
| 34 | 2,295 |
| 35 | 2,435 |

Lampiran 2. Data hasil pengukuran standar glukosa

| Konsentrasi glukosa (ppm) | Absorbansi pada panjang gelombang 600 nm | | Absorbansi rata-rata |
|---------------------------|--|------|----------------------|
| | A 1 | A 2 | |
| 50 | 0,125 | 0,13 | 0,1275 |
| 100 | 0,35 | 0,36 | 0,335 |
| 400 | 1,68 | 1,67 | 1,675 |
| 600 | 2,515 | 2,56 | 2,5375 |
| 800 | 3,49 | 3,51 | 3,5 |
| 1000 | 4,095 | 4,15 | 4,1225 |



Lampiran 3. Data hasil pengukuran aktivitas amilase

| Waktu (jam) | Abs | Konsentrasi (mg/L) | Konsentrasi (mg) | mmol | unit | U/mL |
|-------------|-------|--------------------|------------------|--------|---------|----------|
| 3 | 1,98 | 469,51 | 0,4695 | 0,0026 | 0,04343 | 0,21717 |
| 6 | 2,4 | 567,18 | 0,5671 | 0,0031 | 0,05247 | 0,262353 |
| 8 | 2,2 | 520,67 | 0,5206 | 0,0028 | 0,04817 | 0,240839 |
| 9 | 2,295 | 542,76 | 0,5427 | 0,0030 | 0,05021 | 0,251058 |
| 10 | 2,22 | 525,32 | 0,5253 | 0,0029 | 0,0486 | 0,24299 |
| 11 | 2,305 | 545,09 | 0,5450 | 0,0030 | 0,05043 | 0,252134 |
| 12 | 2,33 | 550,90 | 0,5509 | 0,0031 | 0,05096 | 0,254823 |
| 17 | 2,245 | 531,13 | 0,5311 | 0,0029 | 0,04914 | 0,24568 |
| 21 | 2,23 | 527,65 | 0,5276 | 0,0029 | 0,04881 | 0,244066 |
| 26 | 2,825 | 666,02 | 0,6660 | 0,0036 | 0,06161 | 0,30807 |
| 31 | 3,125 | 735,79 | 0,7357 | 0,0040 | 0,06807 | 0,340341 |
| 34 | 2,965 | 698,58 | 0,6985 | 0,0038 | 0,06463 | 0,32313 |

Diketahui :

Nilai regresi standar glukosa = $Y = 0,0043x + 0,0389$

Substrat + crude amilase = 1 mL = 0,001 L

Crude amilase = 0,2 mL = 0,0002 L

Waktu inkubasi = 60 menit = 1 jam

Berat molekul glukosa = 180,16

Ditanya :

$$1. \text{ Konsentrasi glukosa} = \frac{\text{absorbansi} + 0,0389}{0,0043}$$

$$= \frac{1,98 + 0,0389}{0,0043}$$

$$= 469,51 \text{ mg/L}$$

$$2. \text{ Massa glukosa} = \text{konsentrasi glukosa} \times (\text{substrat} + \text{crude amilase})$$

$$= 469,51 \text{ mg/L} \times 0,001 \text{ L}$$

$$= 0,46951 \text{ mg}$$

$$3. \text{ mmol glukosa} = \frac{\text{massa glukosa}}{\text{berat molekul glukosa}}$$

$$= \frac{0,46951}{180,16}$$

$$= 0,0026 \text{ mmol} = 2,60 \text{ } \mu\text{mol}$$

$$4. \text{ Unit} = \frac{\mu\text{mol}}{\text{waktu}}$$

$$= \frac{2,60}{60} = 0,0434 \text{ unit}$$

$$5. \text{ Unit/mL} = \frac{\text{unit}}{\text{crude amilase}}$$

$$= \frac{0,0434}{0,2}$$

$$= 0,217 \text{ Unit/mL}$$

Lampiran 4. Data Hasil Fraksinasi

| Fraksi (%) | Abs | Konsentrasi (mg/L) | Konsentrasi (mg) | mmol | Unit | U/mL |
|------------|----------|--------------------|------------------|----------|--------|-------|
| 0-30 | 0,164109 | 532,186 | 0,532186 | 0,002954 | 0,0492 | 0,164 |
| 30-70 | 0,026407 | 85,63558 | 0,085636 | 0,000475 | 0,0079 | 0,026 |

Diketahui :

Nilai regresi standar glukosa = $Y = 0,0043x + 0,0389$

Substrat + crude amilase = 1 mL = 0,001 L

Crude amilase = 0,3 mL = 0,0003 L

Waktu inkubasi = 60 menit = 1 jam

Berat molekul glukosa = 180,16

Ditanya :

$$\begin{aligned}
 1. \text{ Konsentrasi glukosa} &= \frac{\text{absorbansi} + 0,0389}{0,0043} \\
 &= \frac{2,2495 + 0,0389}{0,0043} \\
 &= 532,186 \text{ mg/L}
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Massa glukosa} &= \text{konsentrasi glukosa} \times (\text{substrat} + \text{crude amilase}) \\
 &= 532,186 \text{ mg/L} \times 0,001 \text{ L} \\
 &= 0,532186 \text{ mg}
 \end{aligned}$$

$$\begin{aligned}
 3. \text{ mmol glukosa} &= \frac{\text{massa glukosa}}{\text{berat molekul glukosa}} \\
 &= \frac{0,532186}{180,16} \\
 &= 0,002954 \text{ mmol} = 2,953 \text{ } \mu\text{mol}
 \end{aligned}$$

$$4. \text{ Unit} = \frac{\mu\text{mol}}{\text{waktu}}$$
$$= \frac{2,953}{60} = 0,0492 \text{ unit}$$

$$5. \text{ Unit/mL} = \frac{\text{unit}}{\text{crude amilase}}$$
$$= \frac{0,0492}{0,3}$$
$$= 0,164 \text{ Unit/mL}$$



Lampiran 5. Data hasil penentuan pH optimum aktivitas amilase

| pH | Abs | Konsentrasi (mg/L) | Konsentrasi (mg) | mmol | unit | U/mL |
|----|--------|--------------------|------------------|---------|---------|---------|
| 4 | 0,165 | 47,418 | 0,0474 | 0,00026 | 0,00438 | 0,02193 |
| 5 | 0,335 | 86,953 | 0,0869 | 0,00048 | 0,00804 | 0,04022 |
| 6 | 0,3225 | 84,046 | 0,0840 | 0,00046 | 0,00777 | 0,03887 |
| 7 | 0,3525 | 91,023 | 0,0910 | 0,00050 | 0,00842 | 0,04210 |
| 8 | 0,325 | 84,627 | 0,0846 | 0,00046 | 0,00782 | 0,03914 |
| 9 | 0,545 | 135,79 | 0,1357 | 0,00075 | 0,01256 | 0,06281 |
| 10 | 0,1275 | 38,697 | 0,0386 | 0,00021 | 0,00358 | 0,0179 |

Diketahui :

Nilai regresi standar glukosa = $Y = 0,0043x + 0,0389$

Substrat + crude amilase = 1 mL = 0,001 L

Crude amilase = 0,2 mL = 0,0002 L

Waktu inkubasi = 60 menit = 1 jam

Berat molekul glukosa = 180,16

Ditanya :

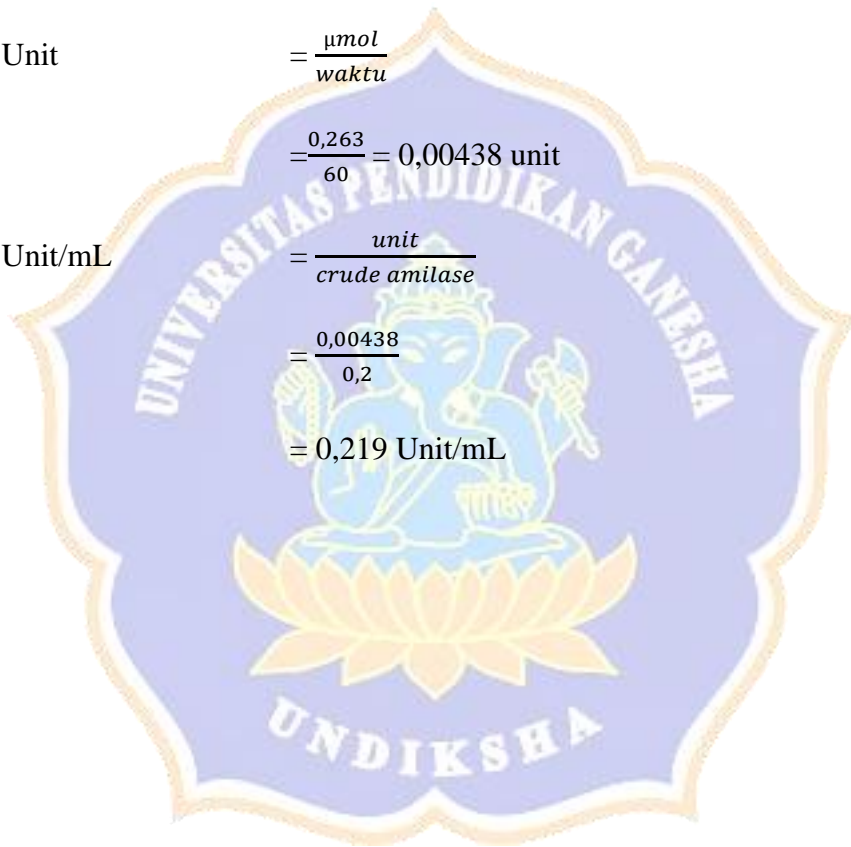
$$\begin{aligned}
 1. \text{ Konsentrasi glukosa} &= \frac{\text{absorbansi} + 0,0389}{0,0043} \\
 &= \frac{0,165 + 0,0389}{0,0043} \\
 &= 47,418 \text{ mg/L}
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Massa glukosa} &= \text{konsentrasi glukosa} \times (\text{substrat} + \text{crude amilase}) \\
 &= 47,418 \text{ mg/L} \times 0,001 \text{ mL} \\
 &= 0,0474 \text{ mg}
 \end{aligned}$$

$$\begin{aligned}
 3. \text{ mmol glukosa} &= \frac{\text{massa glukosa}}{\text{berat molekul glukosa}} \\
 &= \frac{0,0474}{180,16} \\
 &= 0,00026 \text{ mmol} = 0,263 \text{ } \mu\text{mol}
 \end{aligned}$$

$$\begin{aligned}
 4. \text{ Unit} &= \frac{\mu\text{mol}}{\text{waktu}} \\
 &= \frac{0,263}{60} = 0,00438 \text{ unit}
 \end{aligned}$$

$$\begin{aligned}
 5. \text{ Unit/mL} &= \frac{\text{unit}}{\text{crude amilase}} \\
 &= \frac{0,00438}{0,2} \\
 &= 0,219 \text{ Unit/mL}
 \end{aligned}$$



Lampiran 6. Data hasil penentuan temperatur optimum aktivitas amilase

| Suhu (°C) | Abs | Konsentrasi (mg/L) | Konsentrasi (mg) | mmol | Unit | U/mL |
|-----------|-------|--------------------|------------------|-------------|----------|----------|
| 25 | 0,12 | 36,953 | 0,0369 | 0,000205 | 0,003419 | 0,017093 |
| 40 | 0,324 | 84,395 | 0,0843 | 0,000468 | 0,007807 | 0,039037 |
| 50 | 0,488 | 122,53 | 0,1225 | 0,000680 | 0,011336 | 0,056679 |
| 60 | 0,3 | 78,813 | 0,0788 | 0,000437 | 0,007291 | 0,036456 |
| 70 | 0,019 | 13,465 | 0,0134 | 7,47398E-05 | 0,001246 | 0,006228 |

Diketahui :

Nilai regresi standar glukosa = $Y = 0,0043x + 0,0389$

Substrat + crude amilase = 1 mL = 0,001 L

Crude amilase = 0,2 mL = 0,0002 L

Waktu inkubasi = 60 menit = 1 jam

Berat molekul glukosa = 180,16

Ditanya :

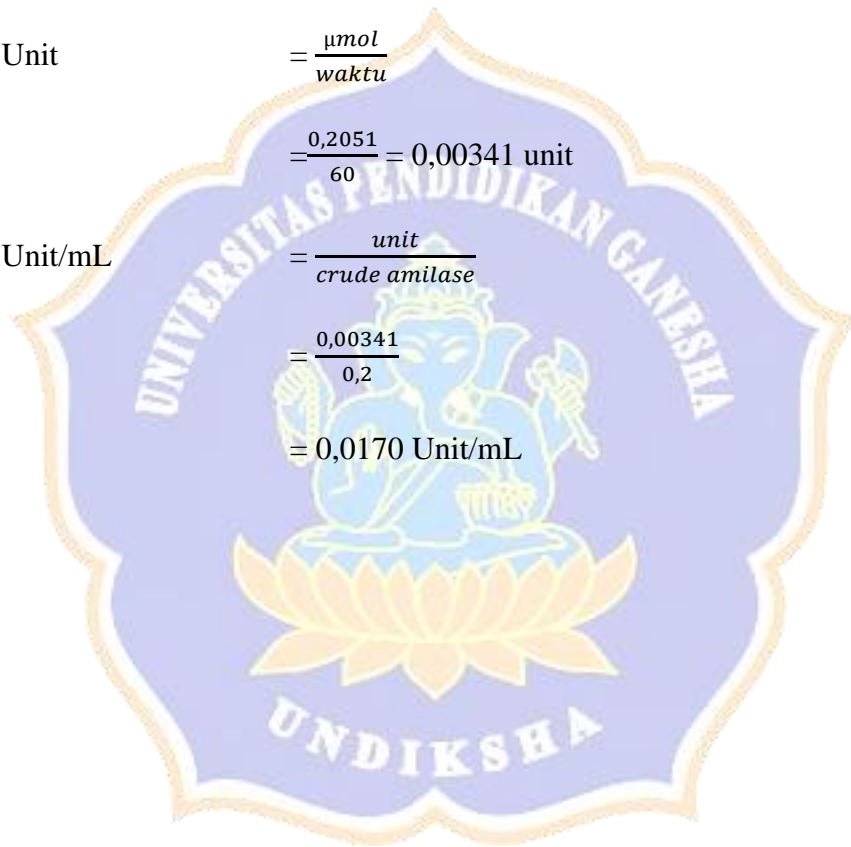
$$\begin{aligned}
 1. \text{ Konsentrasi glukosa} &= \frac{\text{absorbansi} + 0,0389}{0,0043} \\
 &= \frac{0,12 + 0,0389}{0,0043} \\
 &= 36,953 \text{ mg/L}
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Massa glukosa} &= \text{konsentrasi glukosa} \times (\text{substrat} + \text{crude amilase}) \\
 &= 36,953 \text{ mg/L} \times 0,001 \text{ L} \\
 &= 0,0369 \text{ mg}
 \end{aligned}$$

$$\begin{aligned}
 3. \text{ mmol glukosa} &= \frac{\text{massa glukosa}}{\text{berat molekul glukosa}} \\
 &= \frac{0,0369}{180,16} \\
 &= 0,000205 \text{ mmol} = 0,2051 \text{ } \mu\text{mol}
 \end{aligned}$$

$$\begin{aligned}
 4. \text{ Unit} &= \frac{\mu\text{mol}}{\text{waktu}} \\
 &= \frac{0,2051}{60} = 0,00341 \text{ unit}
 \end{aligned}$$

$$\begin{aligned}
 5. \text{ Unit/mL} &= \frac{\text{unit}}{\text{crude amilase}} \\
 &= \frac{0,00341}{0,2} \\
 &= 0,0170 \text{ Unit/mL}
 \end{aligned}$$



Lampiran 7. Data hasil pengaruh kation divalen terhadap aktivitas amilase

| Kation | Abs | Konsentrasi (mg/L) | Konsentrasi (mg) | mmol | Unit | U/mL | Aktivitas relatif (%) |
|------------------|--------|--------------------|------------------|---------|--------|--------|-----------------------|
| Fe ²⁺ | 0,348 | 89,976 | 0,0899 | 0,00049 | 0,0083 | 0,0208 | 76,25 |
| Cu ²⁺ | 0,27 | 71,837 | 0,0718 | 0,00039 | 0,0066 | 0,0166 | 60,87 |
| Pb ²⁺ | 0,398 | 101,604 | 0,1016 | 0,00056 | 0,0093 | 0,0234 | 86,1 |
| Zn ²⁺ | 0,4825 | 121,255 | 0,1212 | 0,00067 | 0,0112 | 0,0280 | 103,75 |
| Mg ²⁺ | 0,433 | 109,744 | 0,1097 | 0,00060 | 0,0101 | 0,0253 | 93,0 |
| Ca ²⁺ | 0,405 | 103,232 | 0,1032 | 0,00057 | 0,0095 | 0,0238 | 87,48 |
| Kontrol | 0,4685 | 118 | 0,118 | 0,00065 | 0,0109 | 0,0272 | 100 |

Diketahui :

Nilai regresi standar glukosa = $Y = 0,0043x + 0,0389$

Substrat + crude amilase = 1 mL = 0,001 L

Crude amilase = 0,4 mL = 0,0004 L

Waktu inkubasi = 60 menit = 1 jam

Berat molekul glukosa = 180,16

Ditanya :

$$1. \text{ Konsentrasi glukosa} = \frac{\text{absorbansi} + 0,0389}{0,0043}$$

$$= \frac{0,348 + 0,0389}{0,0043}$$

$$= 89,976 \text{ mg/L}$$

2. Massa glukosa = konsentrasi glukosa x (substrat + crude amilase)

$$= 89,976 \text{ mg/L} \times 0,001 \text{ L}$$

$$= 0,0899 \text{ mg}$$

3. mmol glukosa = $\frac{\text{massa glukosa}}{\text{berat molekul glukosa}}$

$$= \frac{0,0899}{180,16}$$

$$= 0,00049 \text{ mmol} = 0,4994 \text{ } \mu\text{mol}$$

4. Unit = $\frac{\mu\text{mol}}{\text{waktu}}$

$$= \frac{0,4994}{60} = 0,00832 \text{ unit}$$

5. Unit/mL = $\frac{\text{unit}}{\text{crude amilase}}$

$$= \frac{0,00832}{0,4}$$

$$= 0,0208 \text{ Unit/mL}$$

1. Aktivitas Relatif (%) = $\frac{\frac{\text{Unit}}{\text{mL}} \times 100}{\frac{\text{Unit}}{\text{mL}}_{\text{kontrol}}}$

$$= \frac{0,0208 \frac{\text{Unit}}{\text{mL}} \times 100}{0,0272}$$

$$= 76,25\%$$

Lampiran 8. Data hasil penentuan pengaruh penambahan garam NaCl terhadap aktivitas amilase

| NaCl (%) | Abs | Konsentrasi (mg/L) | Konsentrasi (mg) | mmol | Unit | U/mL | Aktivitas relatif (%) |
|----------|--------|--------------------|------------------|----------|---------|---------|-----------------------|
| 0 | 0,706 | 173,23 | 0,1732 | 0,000961 | 0,01602 | 0,08012 | 100 |
| 5 | 0,5435 | 135,44 | 0,1354 | 0,000751 | 0,0125 | 0,06264 | 78,18 |
| 10 | 0,5385 | 134,27 | 0,1342 | 0,000745 | 0,01242 | 0,06211 | 77,51 |
| 15 | 0,3235 | 84,27 | 0,0842 | 0,000467 | 0,00779 | 0,03898 | 48,65 |
| 25 | 0,2085 | 57,53 | 0,0575 | 0,000319 | 0,00532 | 0,02661 | 33,21 |

Diketahui :

Nilai regresi standar glukosa = $Y = 0,0043x + 0,0389$

Substrat + crude amilase = 1 mL = 0,001 L

Crude amilase = 0,2 mL = 0,0002 L

Waktu inkubasi = 60 menit = 1 jam

Berat molekul glukosa = 180,16

Ditanya :

$$\begin{aligned}
 1. \text{ Konsentrasi glukosa} &= \frac{\text{absorbansi} + 0,0389}{0,0043} \\
 &= \frac{0,706 + 0,0389}{0,0043} \\
 &= 173,23 \text{ mg/L}
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Massa glukosa} &= \text{konsentrasi glukosa} \times (\text{substrat} + \text{crude amilase}) \\
 &= 173,23 \text{ mg/L} \times 0,001 \text{ L} \\
 &= 0,17323 \text{ mg}
 \end{aligned}$$

$$\begin{aligned}
 3. \text{ mmol glukosa} &= \frac{\text{massa glukosa}}{\text{berat molekul glukosa}} \\
 &= \frac{0,17323}{180,16} \\
 &= 0,000961 \text{ mmol} = 0,0961 \mu\text{mol}
 \end{aligned}$$

$$\begin{aligned}
 4. \text{ Unit} &= \frac{\mu\text{mol}}{\text{waktu}} \\
 &= \frac{0,0961}{60} = 0,01602 \text{ unit}
 \end{aligned}$$

$$\begin{aligned}
 5. \text{ Unit/mL} &= \frac{\text{unit}}{\text{crude amilase}} \\
 &= \frac{0,01602}{0,2} \\
 &= 0,0801 \text{ Unit/mL}
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Aktivitas Relatif (\%)} &= \frac{\frac{\text{Unit}}{\text{mL}} \times 100}{\frac{\text{Unit}}{\text{mL}}_{\text{kontrol}}} \\
 &= \frac{0,0801 \frac{\text{Unit}}{\text{mL}} \times 100}{0,0801} \\
 &= 100\%
 \end{aligned}$$

Lampiran 9. Dokumentasi Kegiatan

| Gambar Kegiatan | Keterangan |
|---|--|
|  | <p>Penumbuhan bakteri halofilik di dalam inkubator.</p> |
|  | <p>Penambahan larutan iodine untuk mengetahui isolat bakteri halofilik yang berpotensi menghasilkan amilase ekstraseluler.</p> |
|  | <p>Fraaksinasi amilase isolat K10 (52) dengan menambahkan ammonium sulfat.</p> |
|  | <p>Uji pH dengan menggunakan berbagai pH asam hingga pH basa untuk memperoleh pH optimum dari aktivitas enzim amilase isolat K10 (52).</p> |

| | |
|---|---|
|  | <p>Melakukan uji temperatur terhadap aktivitas enzim amilase isolat K10 (52)</p> |
|  | <p>Uji kation divalen dengan menggunakan berbagai ion logam untuk memperoleh kofaktor terbaik dari aktivitas enzim amilase isolat K10 (52) yang dihasilkan.</p> |
|  | <p>Uji penambahan konsentrasi garam NaCl untuk mengetahui efektivitas enzim amilase yang dihasilkan terhadap berbagai konsentrasi garam.</p> |