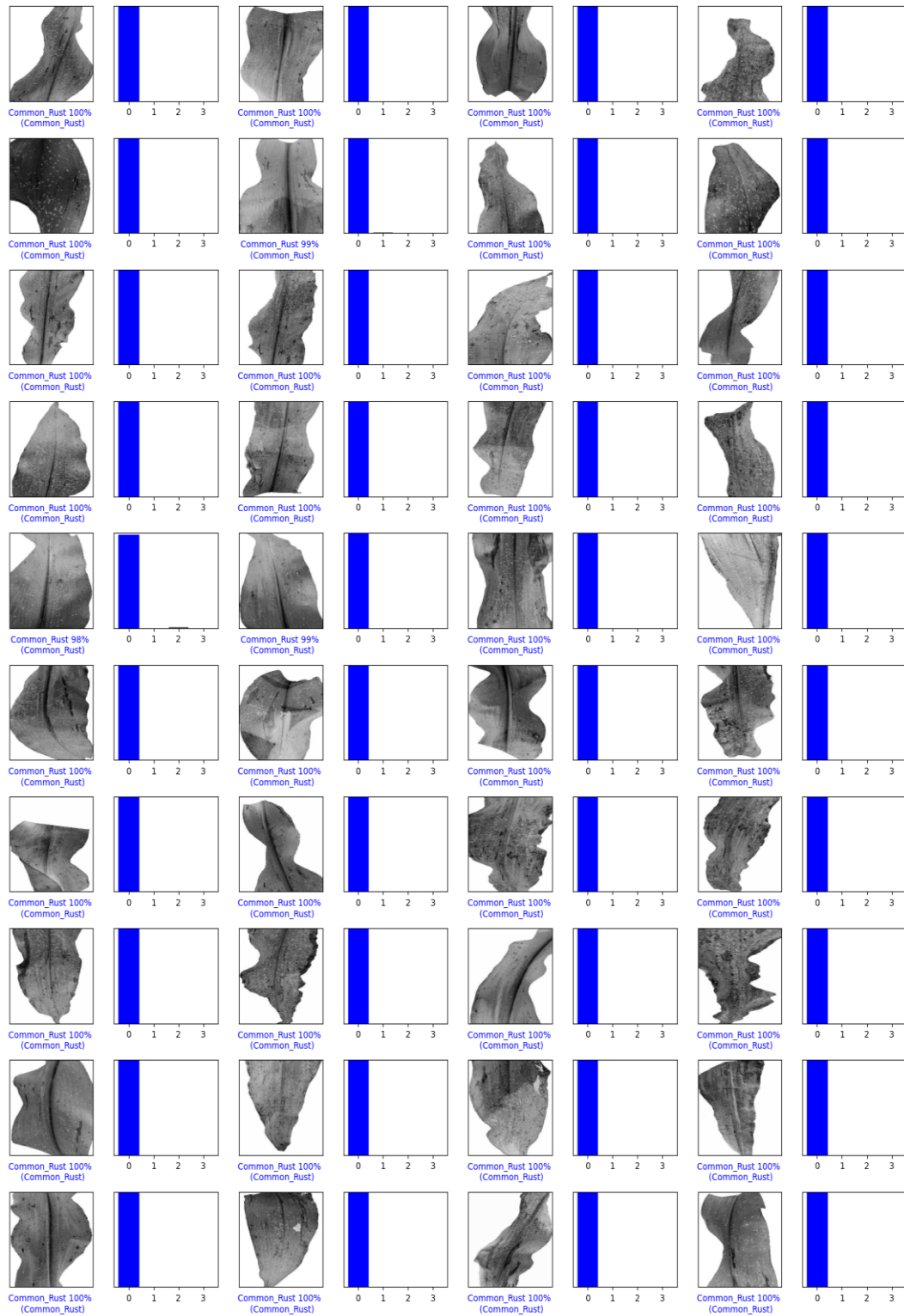
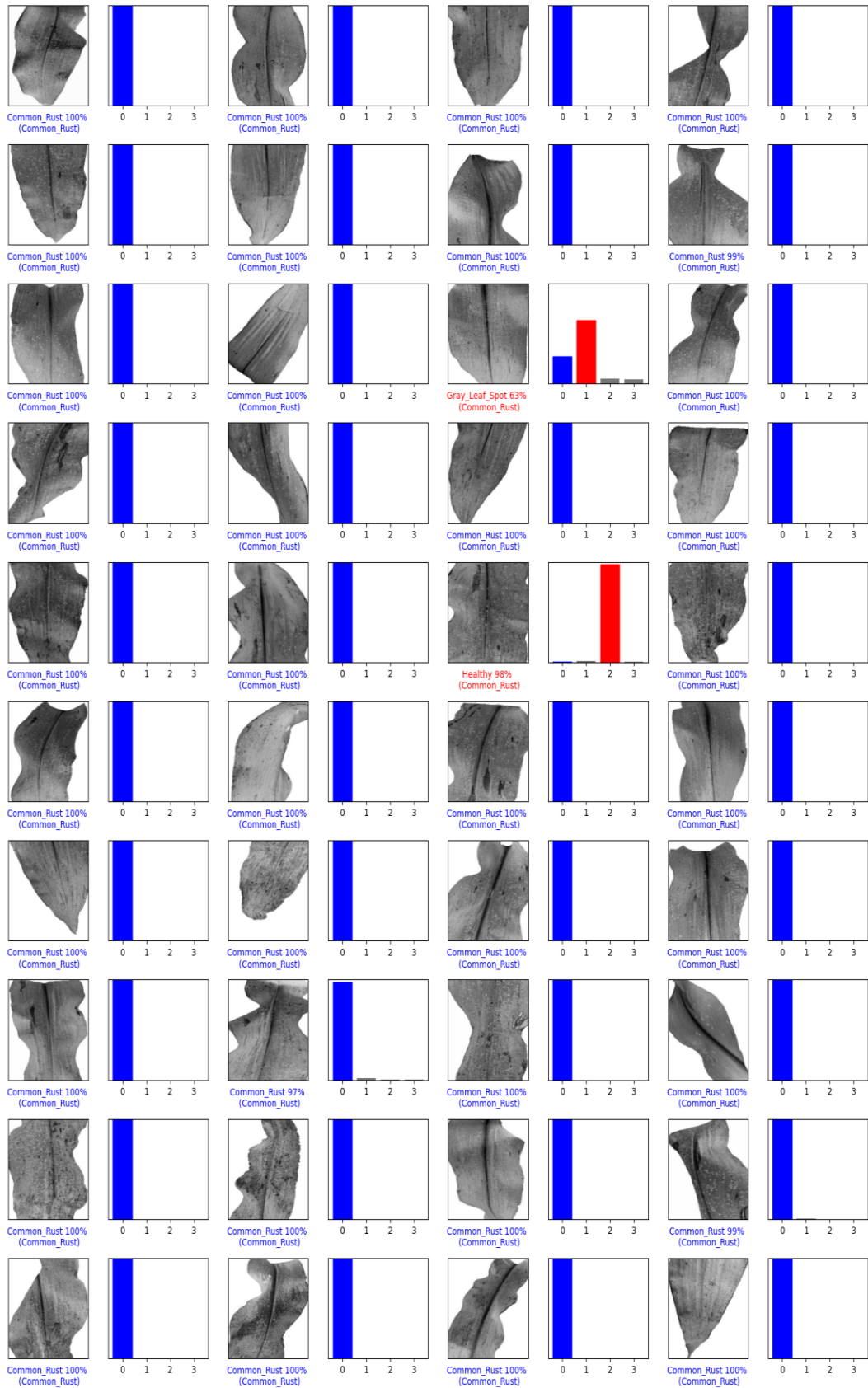
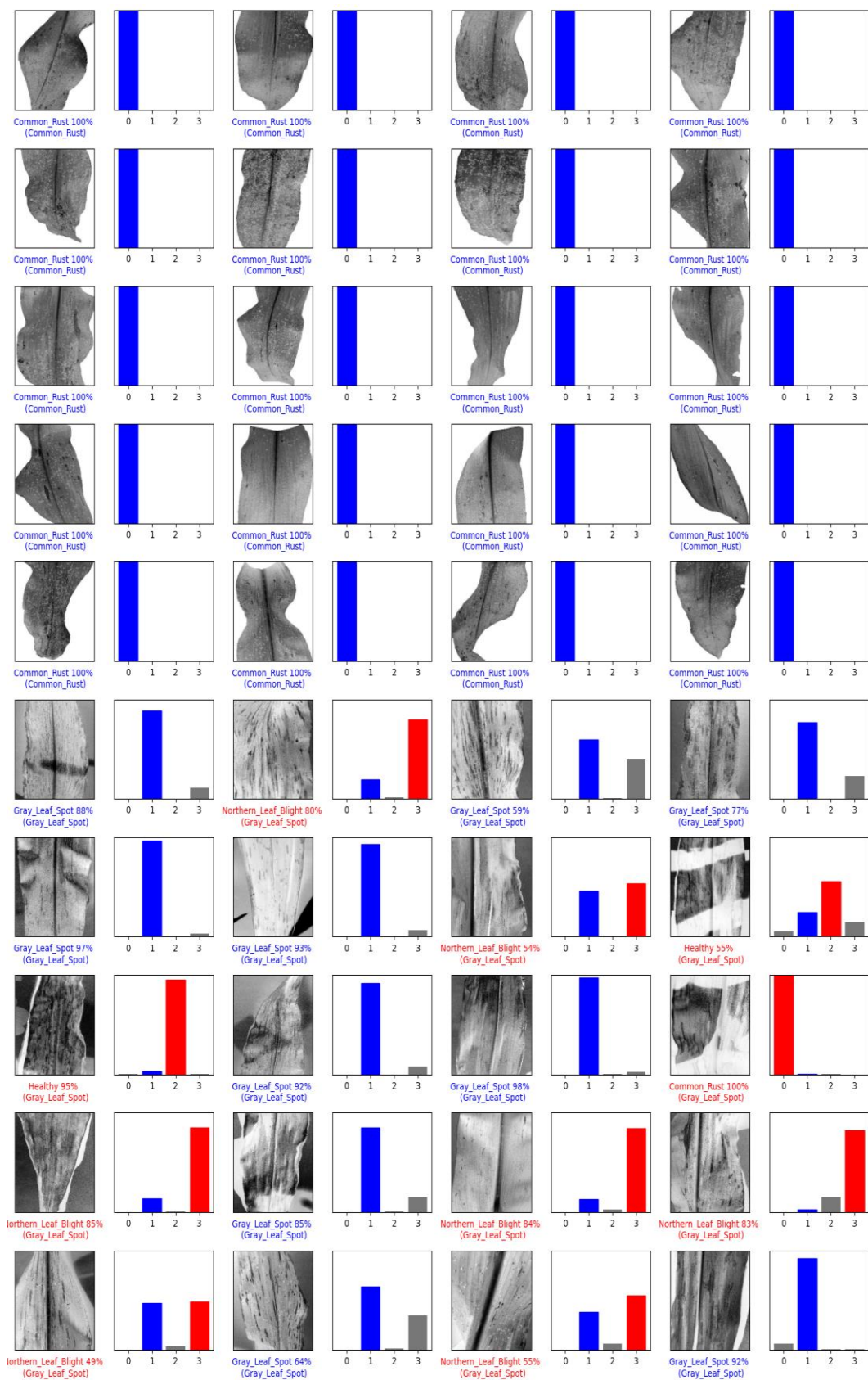


## **LAMPIRAN**

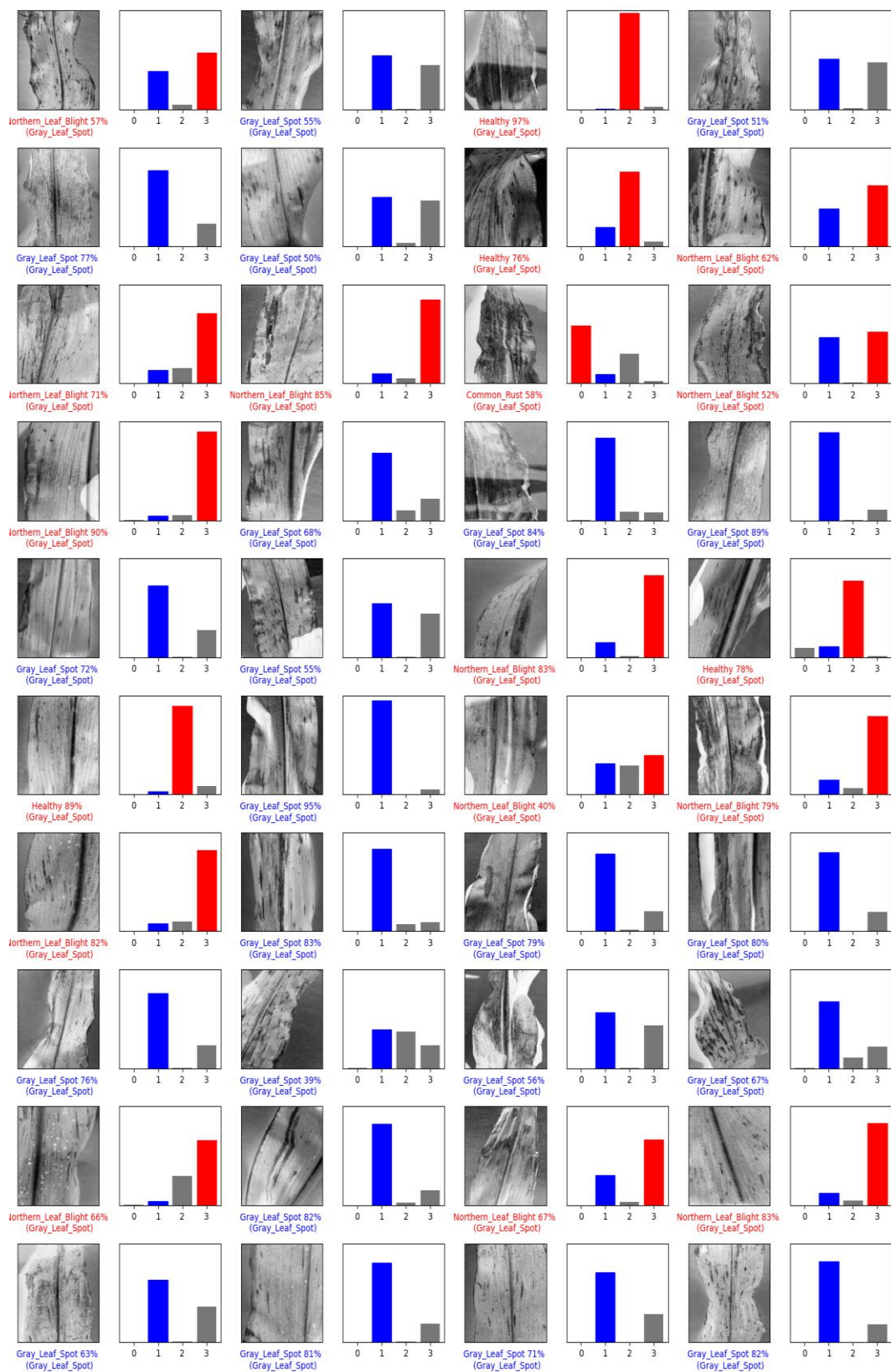
## Lampiran 1. Hasil Deteksi Seluruh Dataset *Testing* dengan *LSTM*

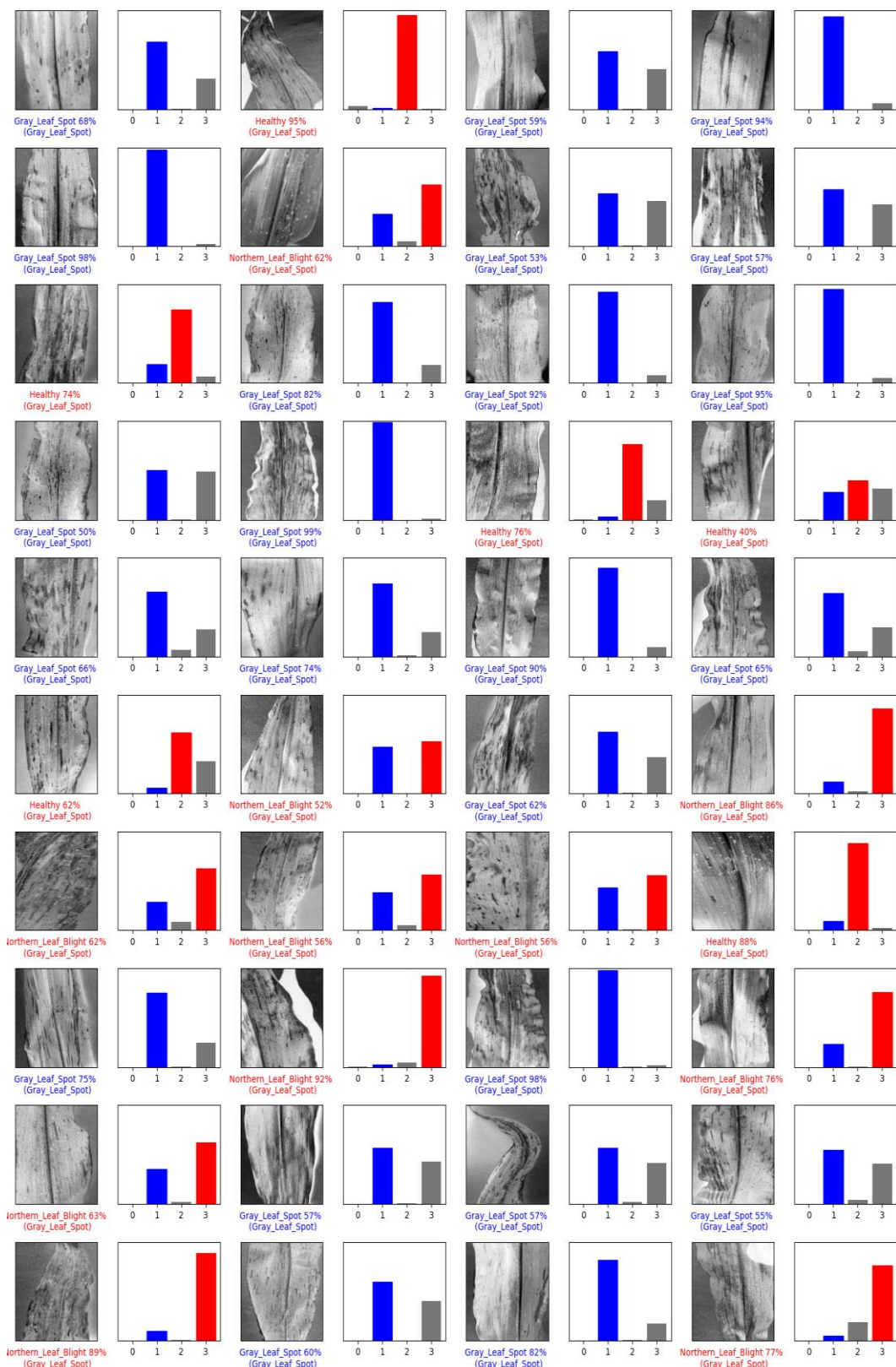


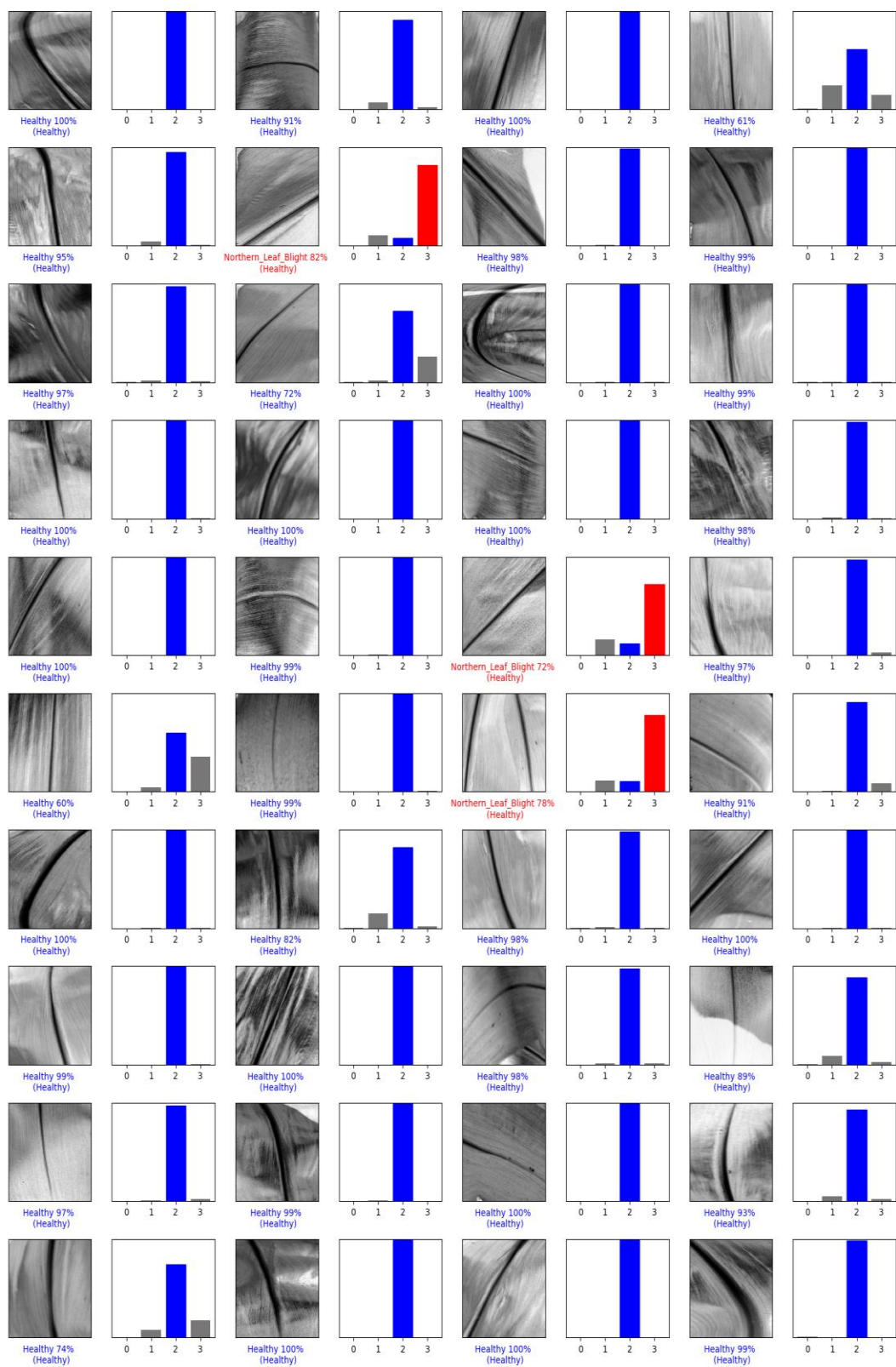




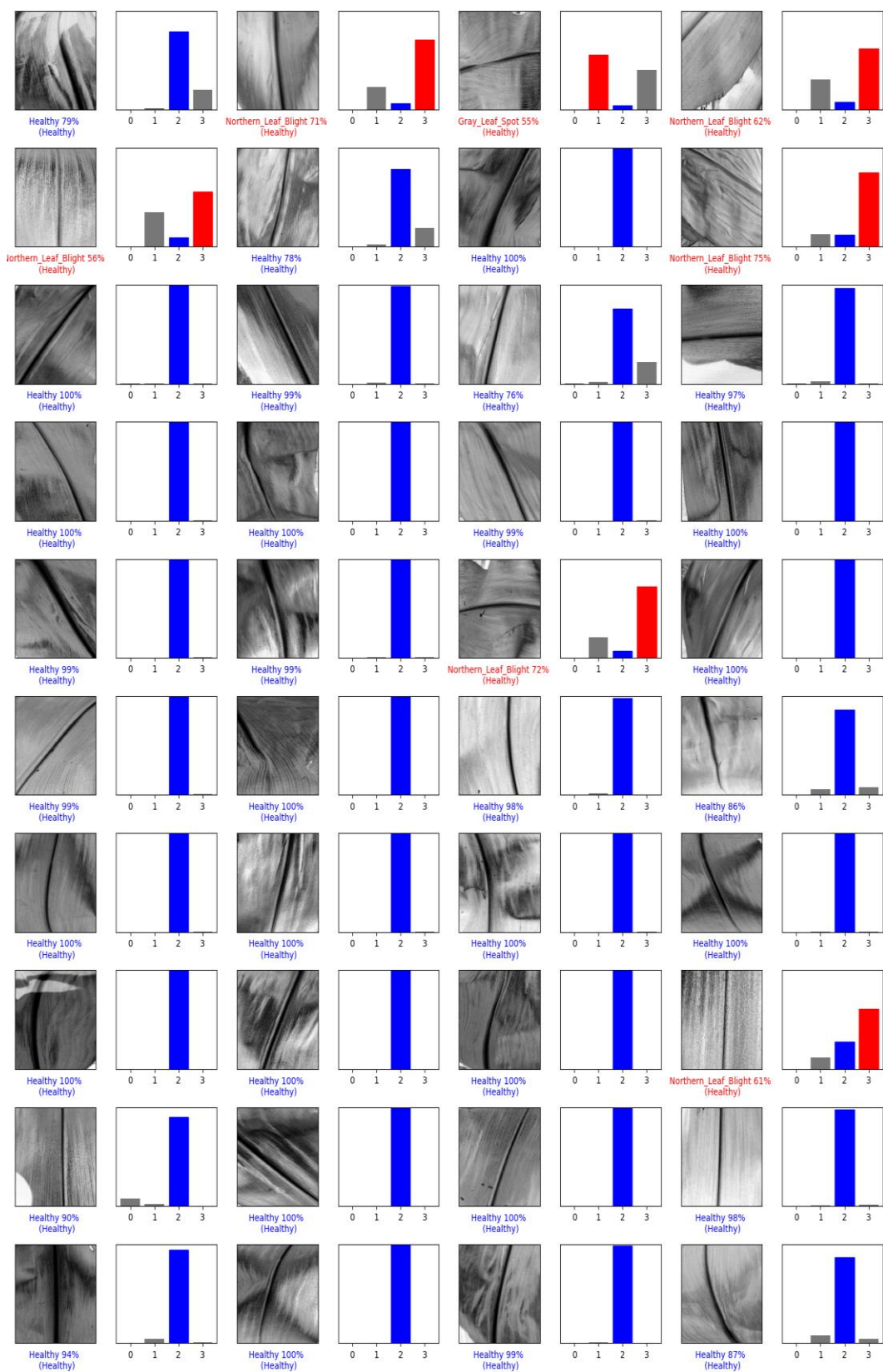


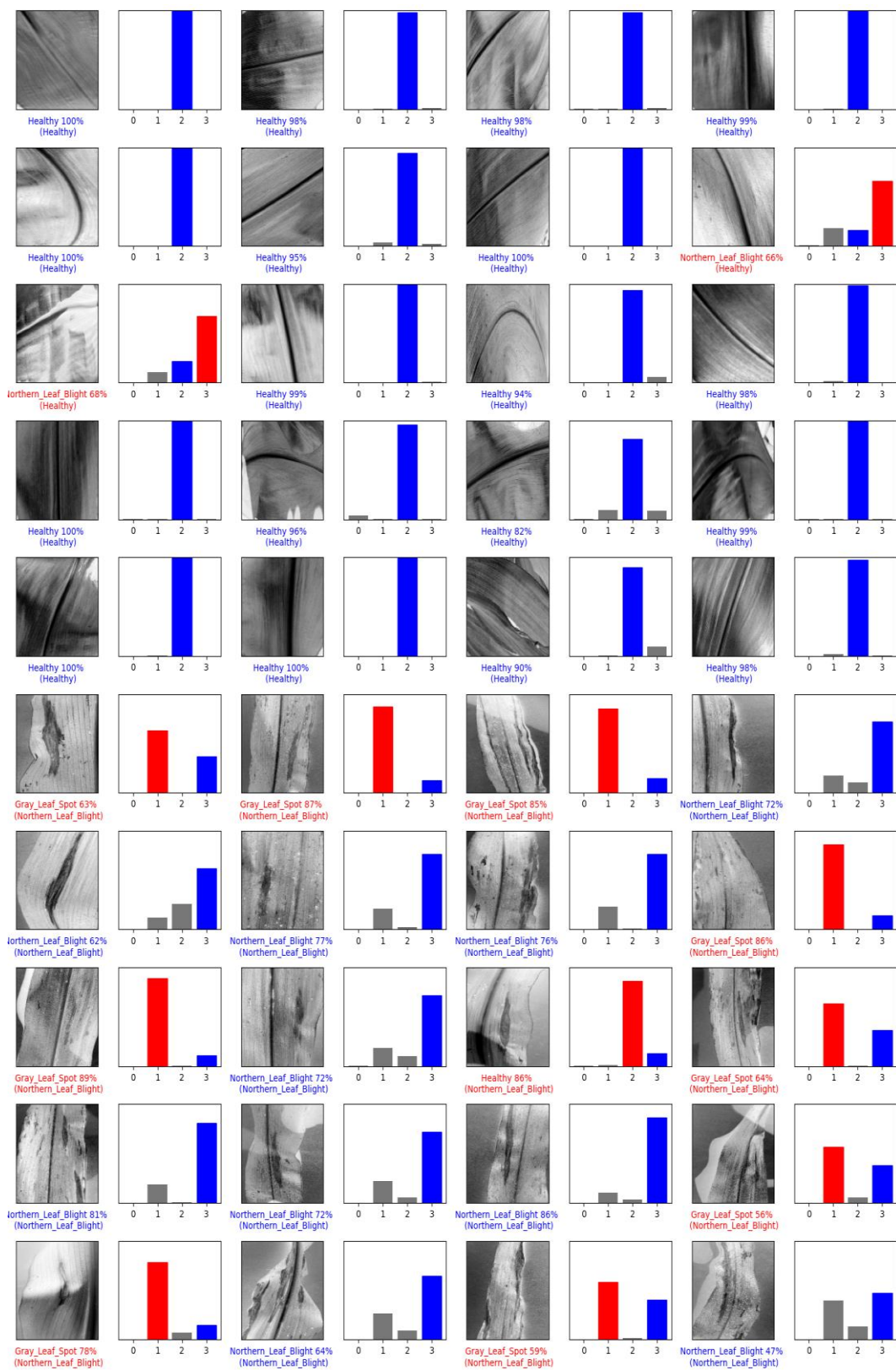


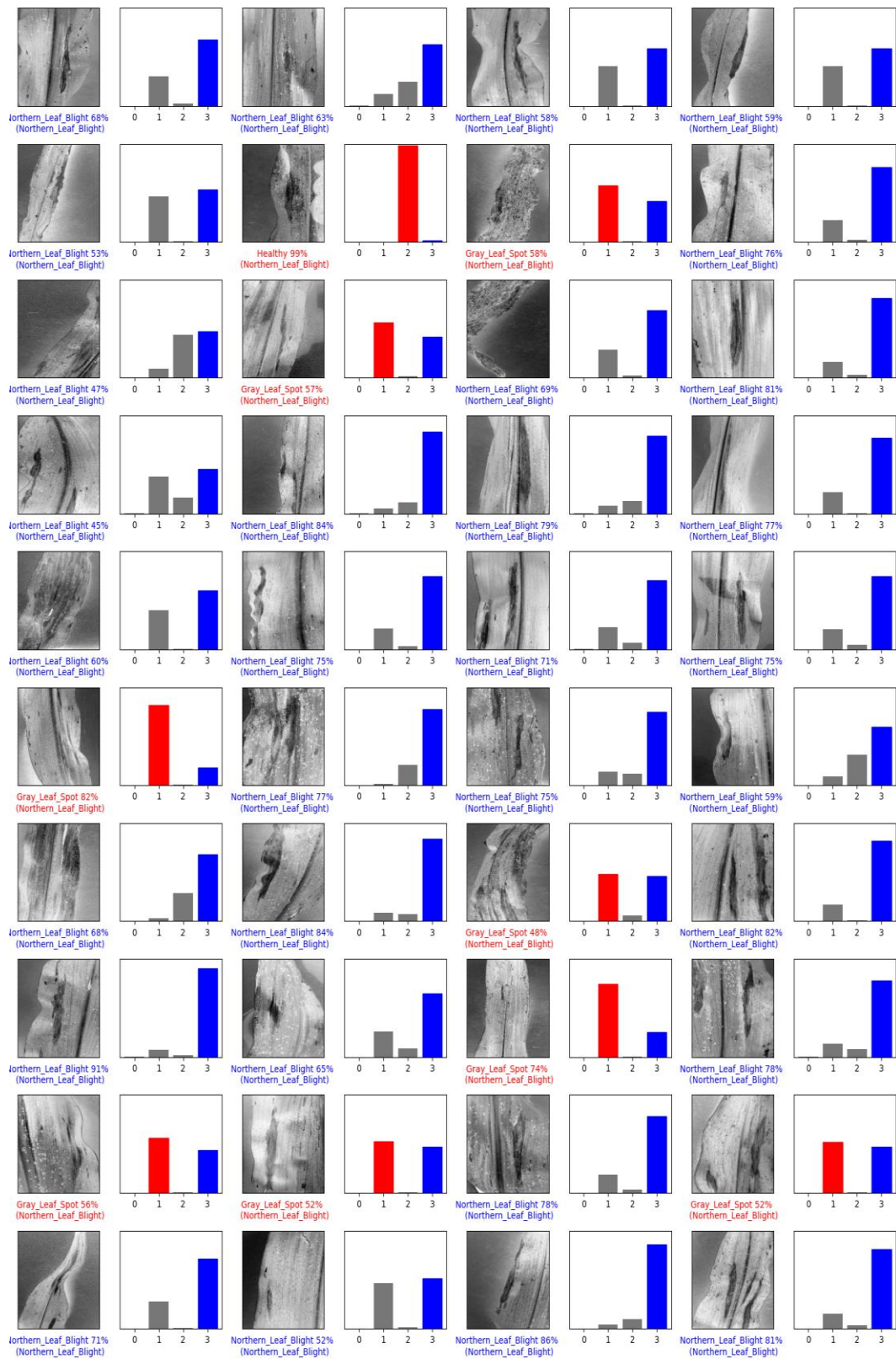




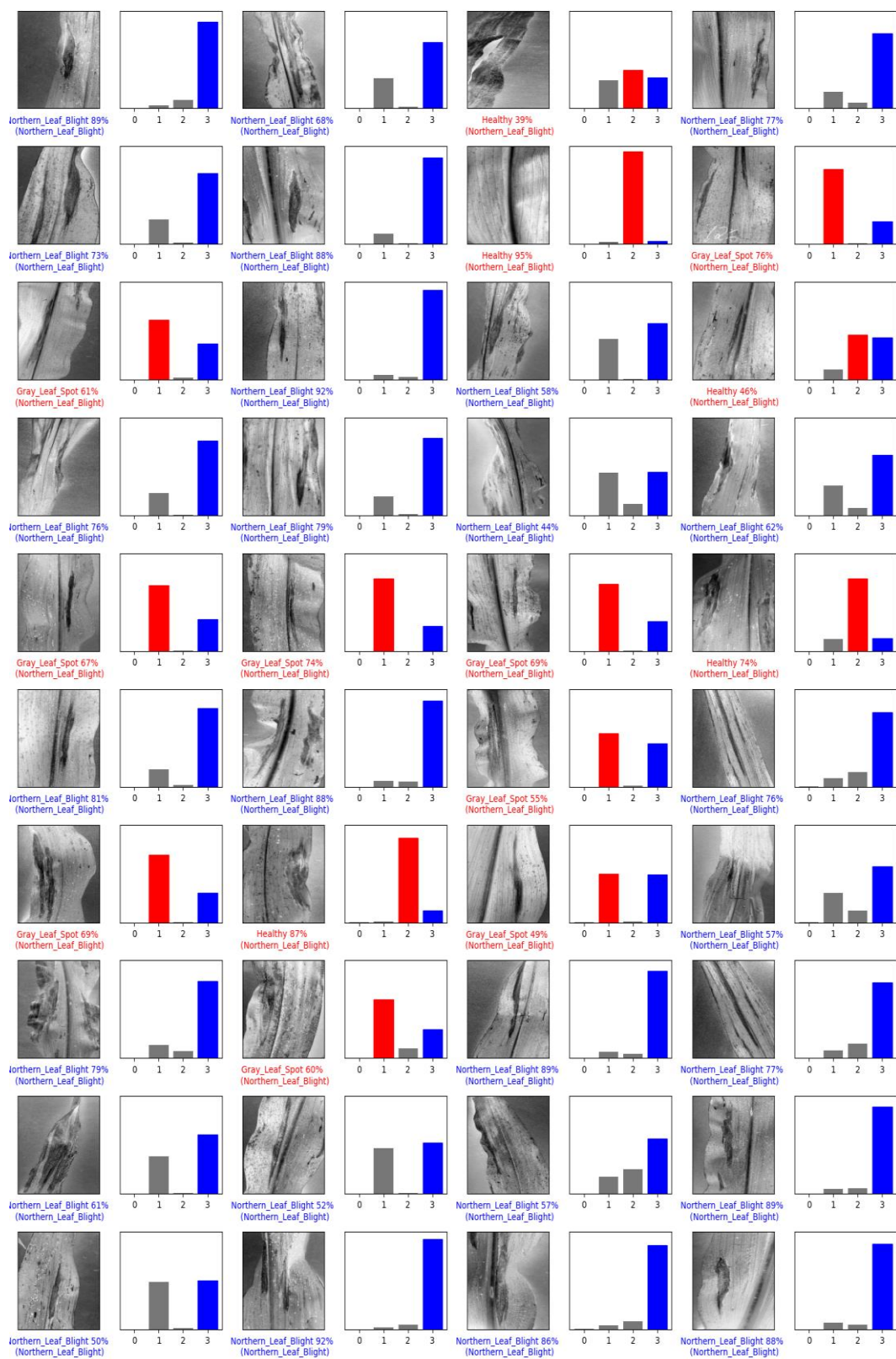




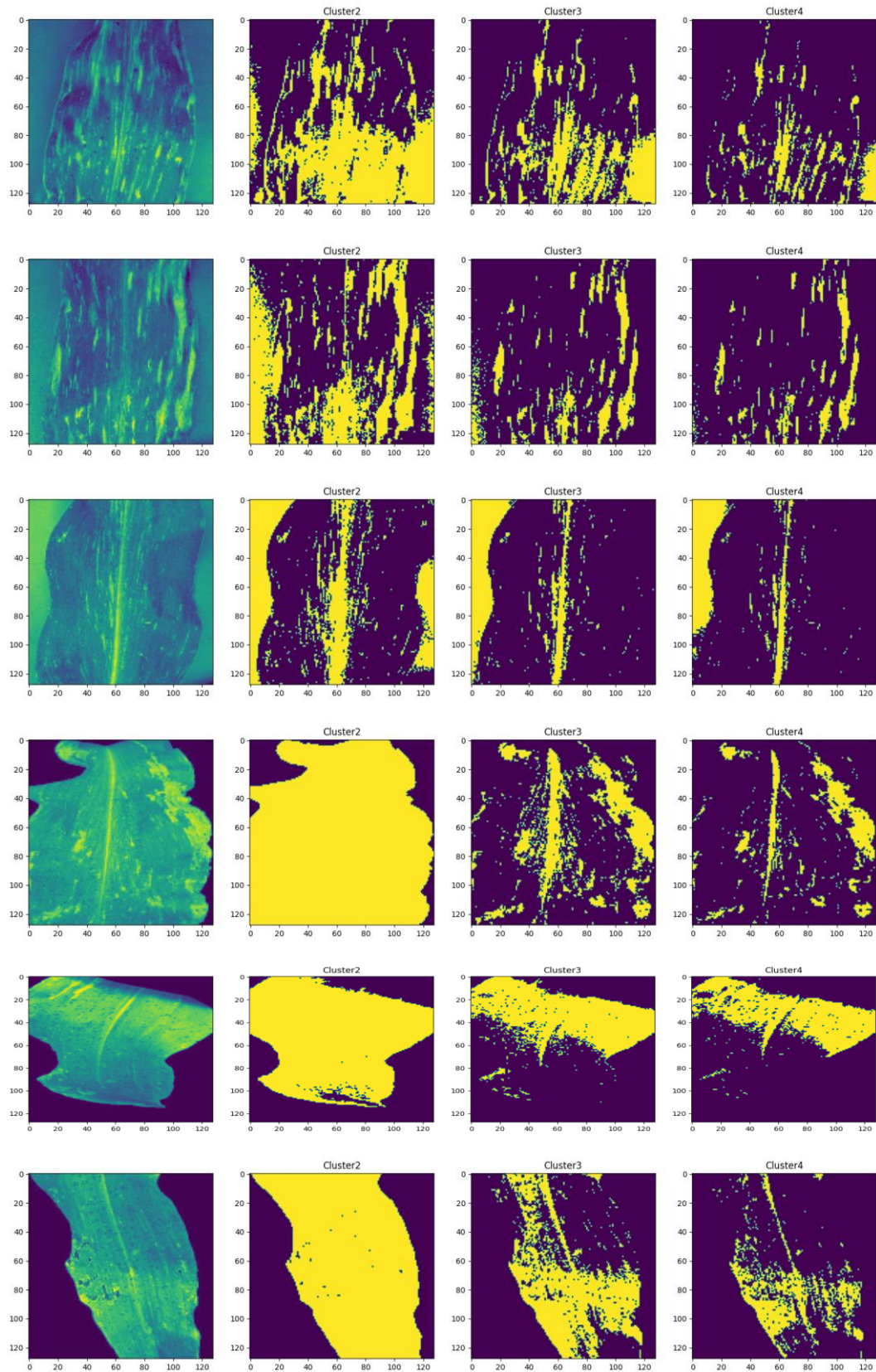




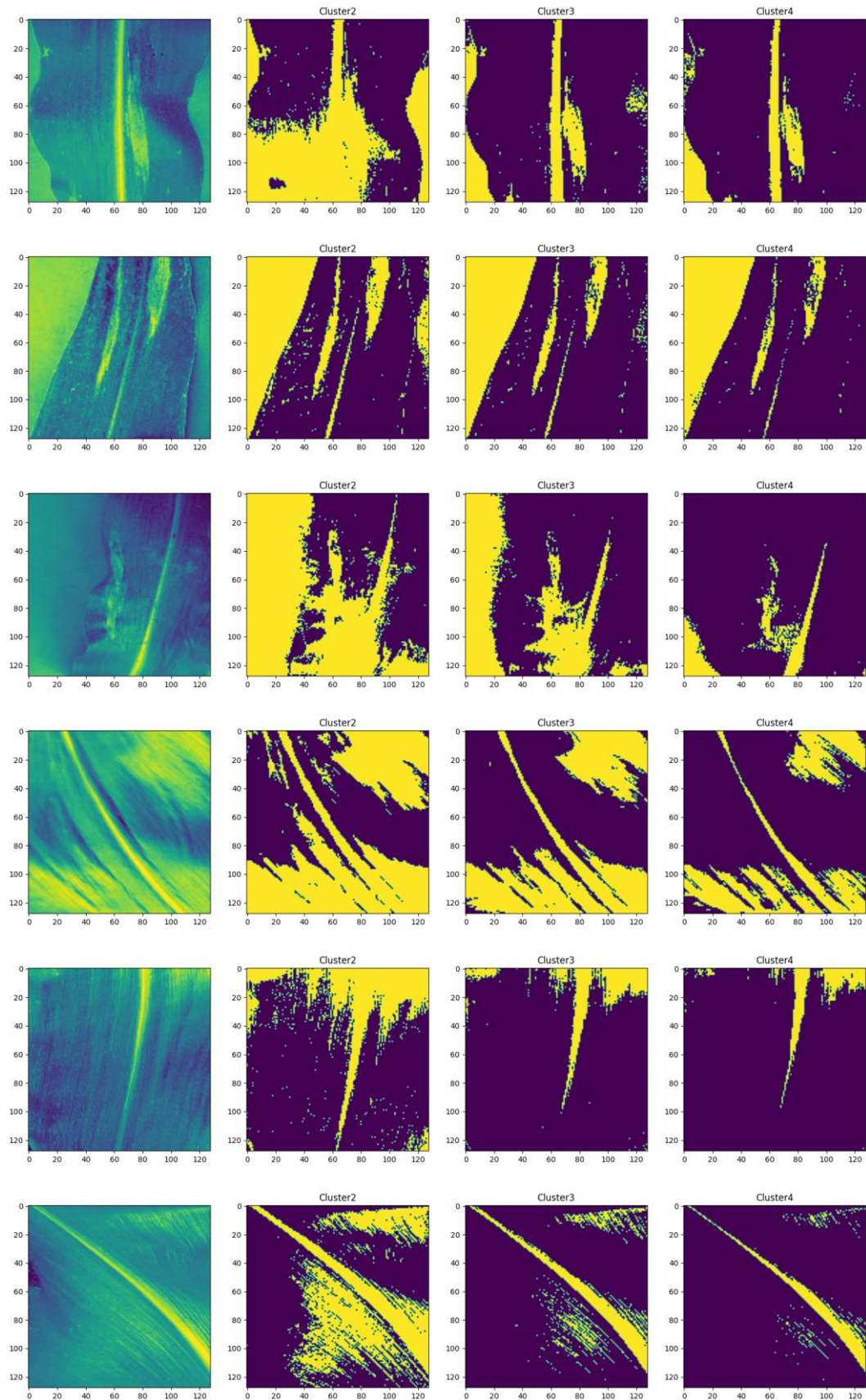




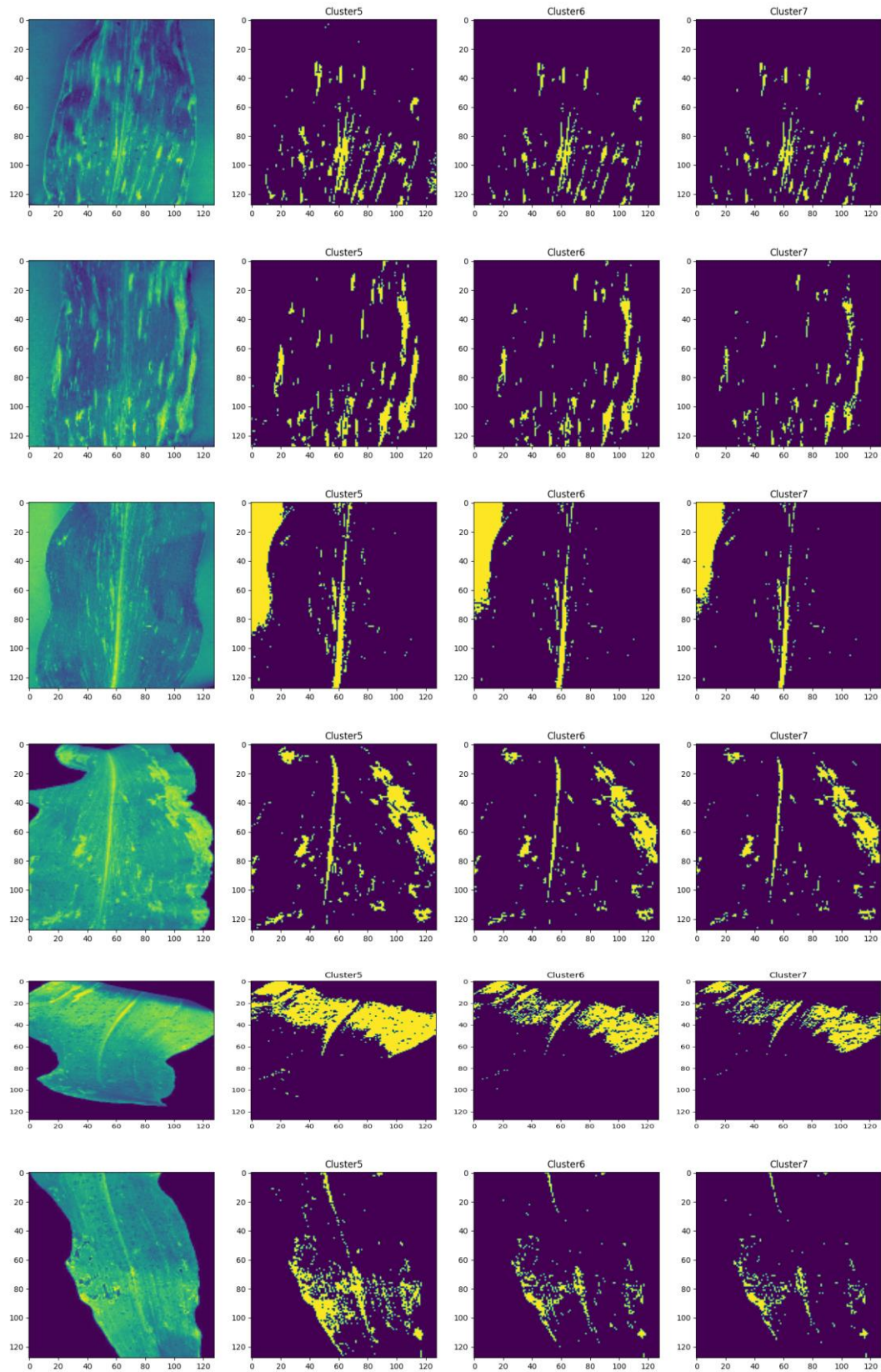
## Lampiran 2. Hasil Segmentasi Citra Cluster 2,3, dan 4 dengan Data Sampel



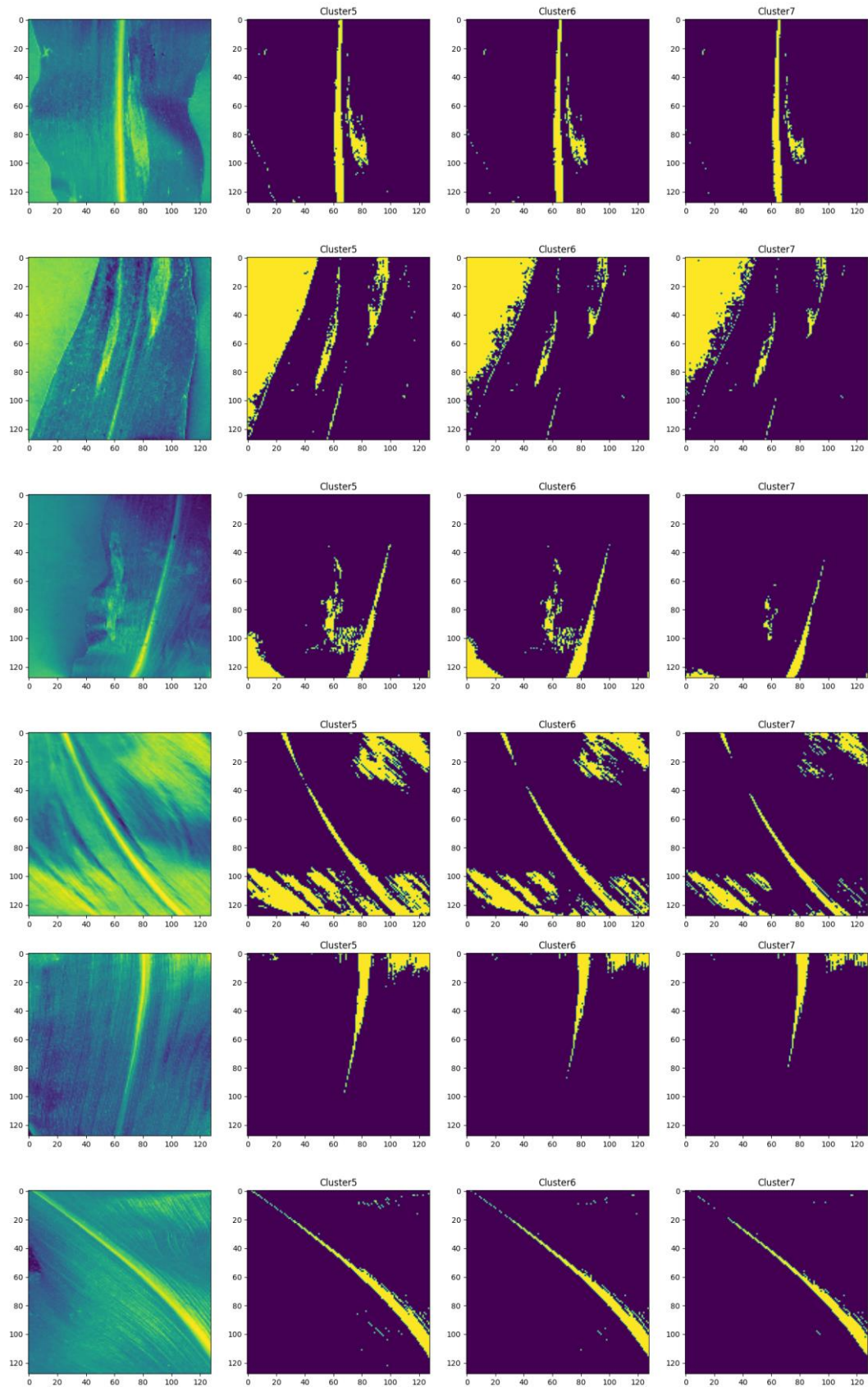




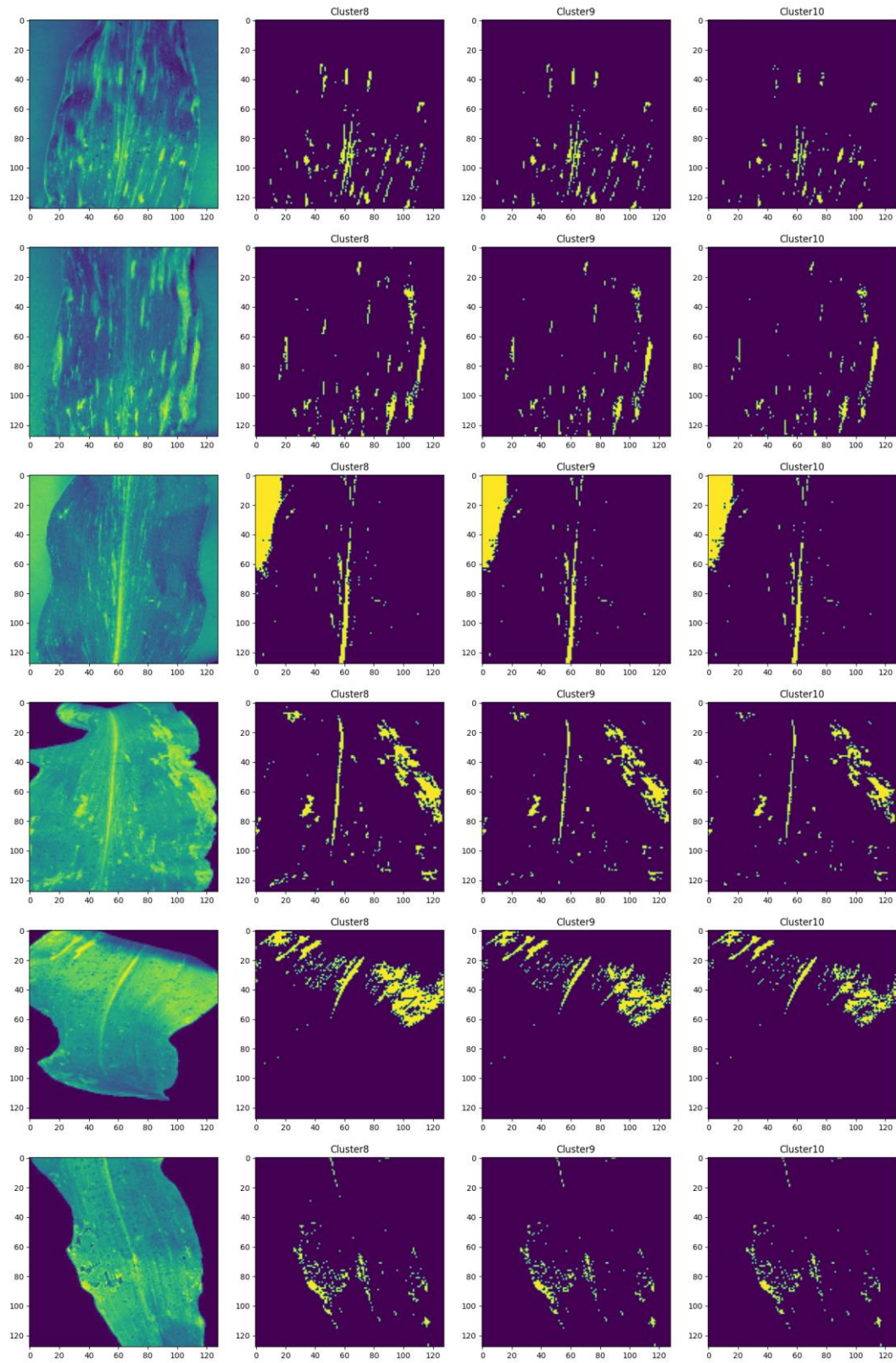
### Lampiran 3. Hasil Segmentasi Citra Cluster 5,6, dan 7 dengan Data Sampel



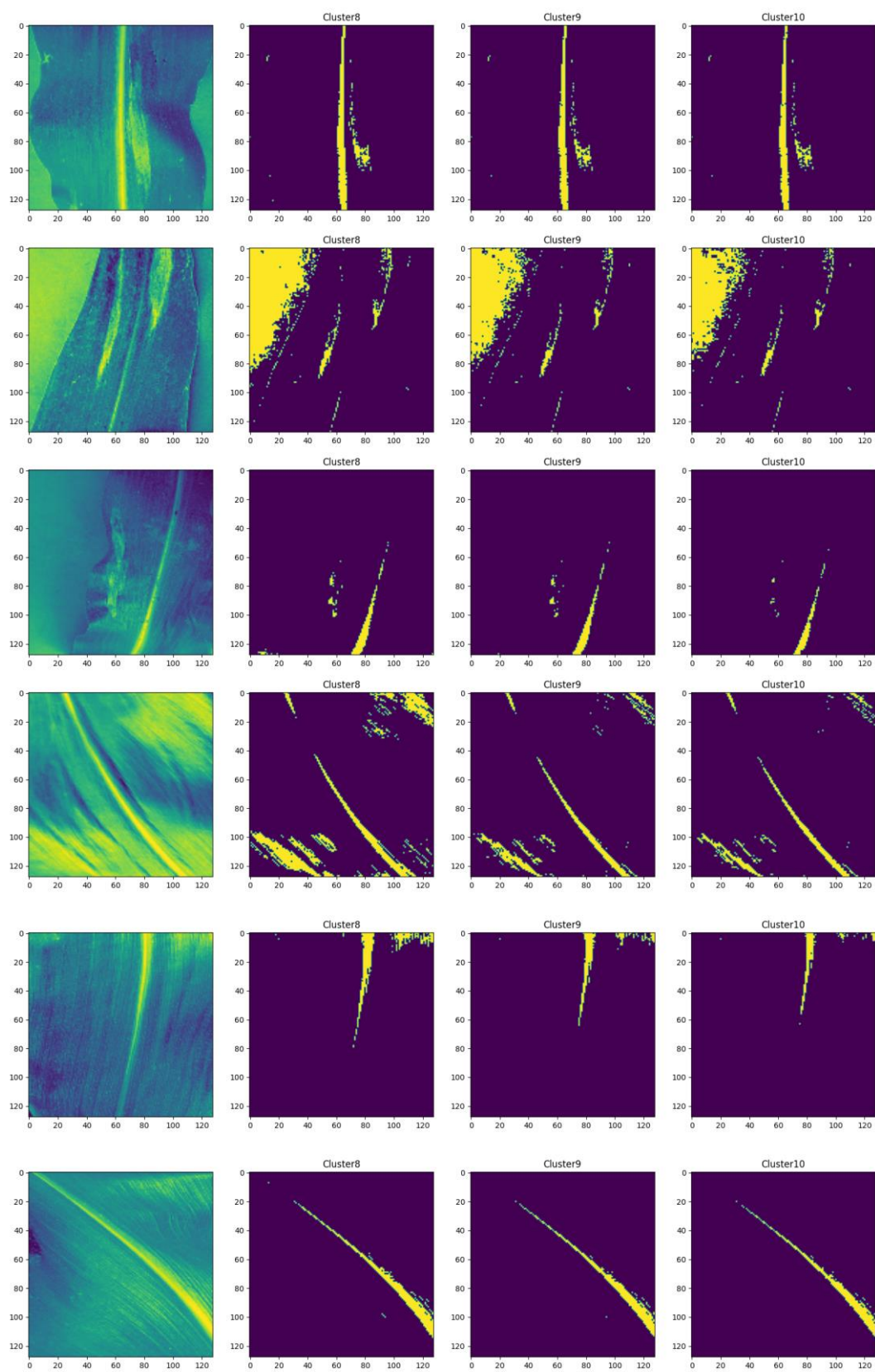




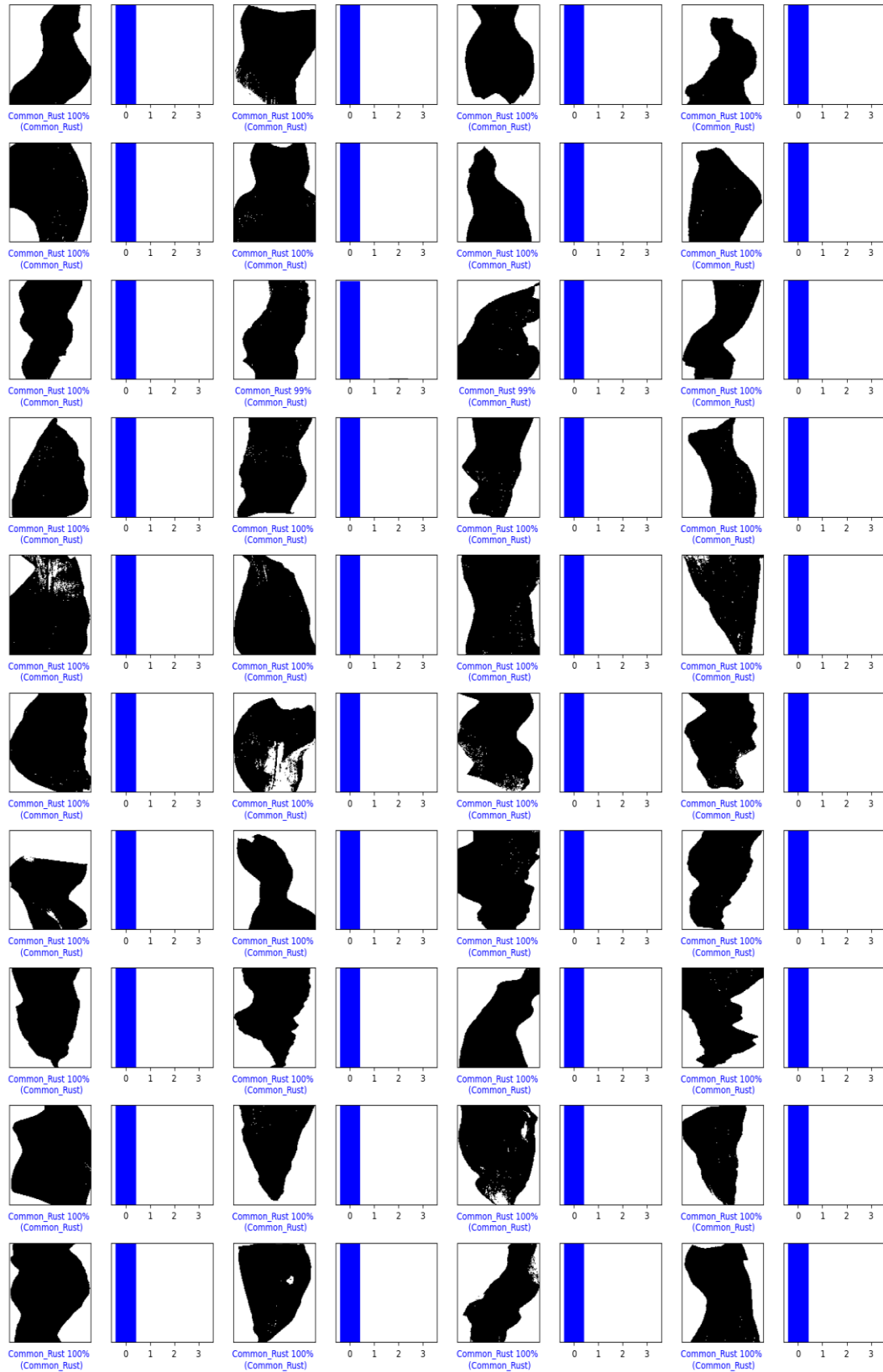
#### Lampiran 4. Hasil Segmentasi Citra Cluster 8,9,10 dengan Data Sampel

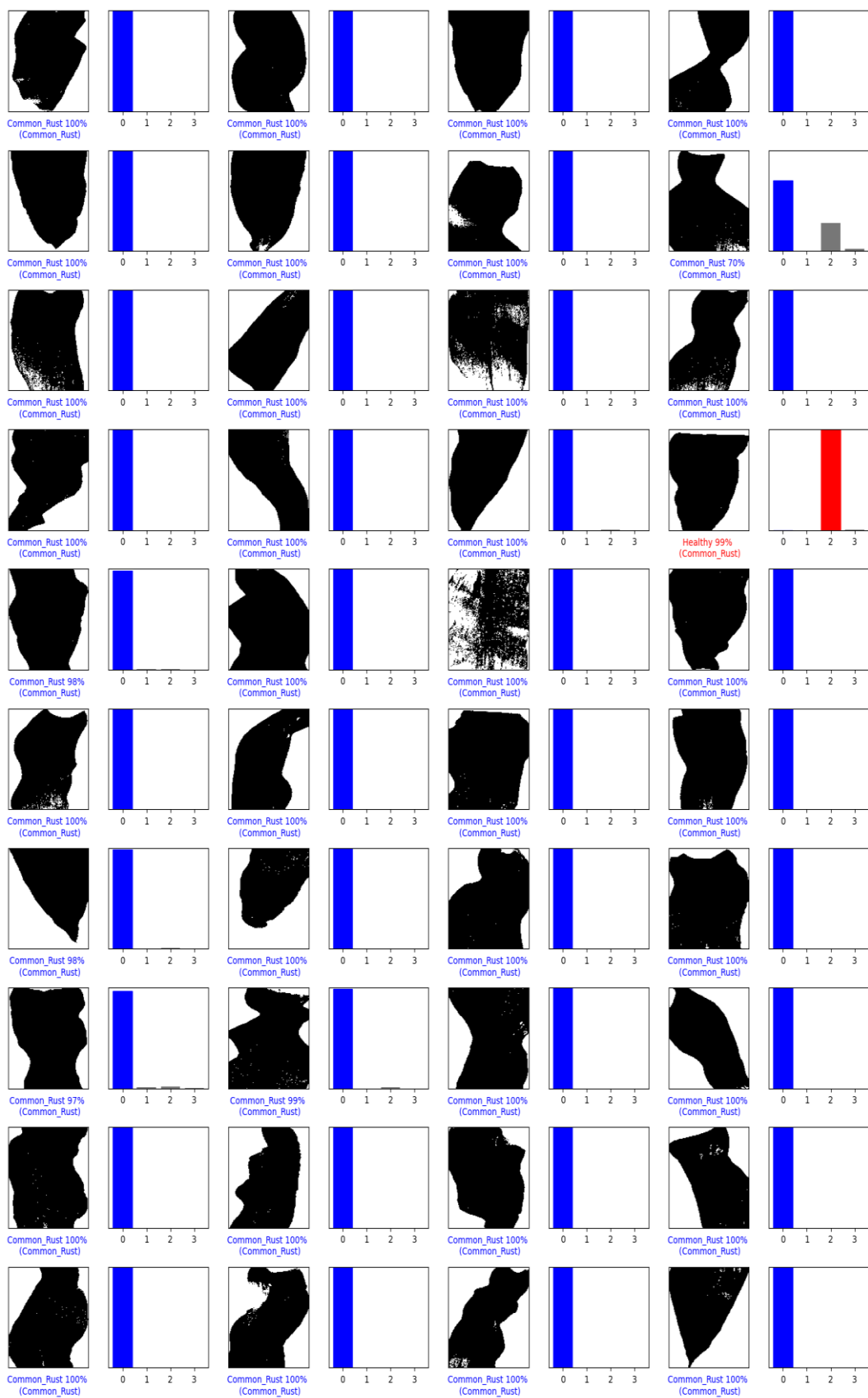




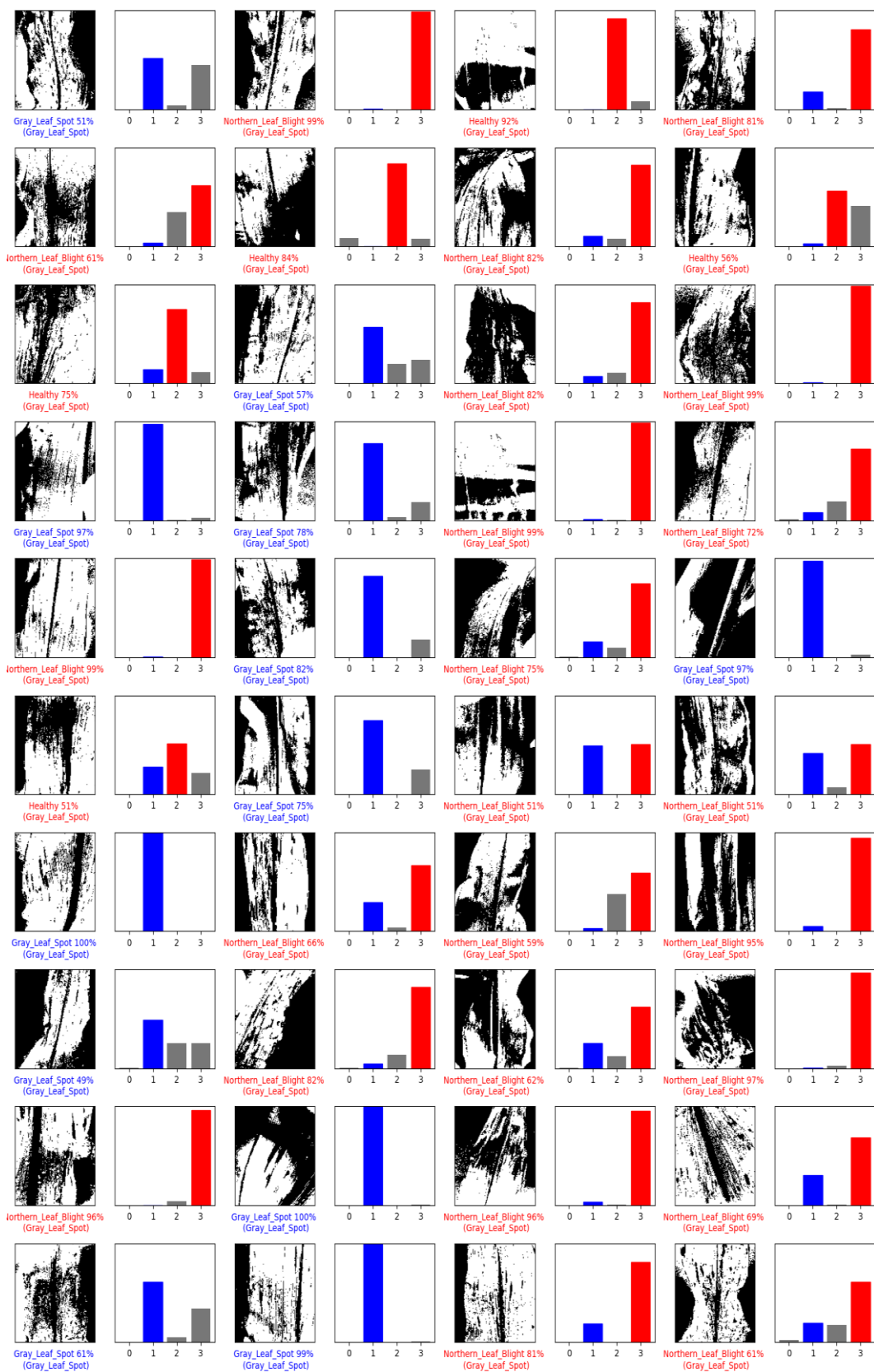


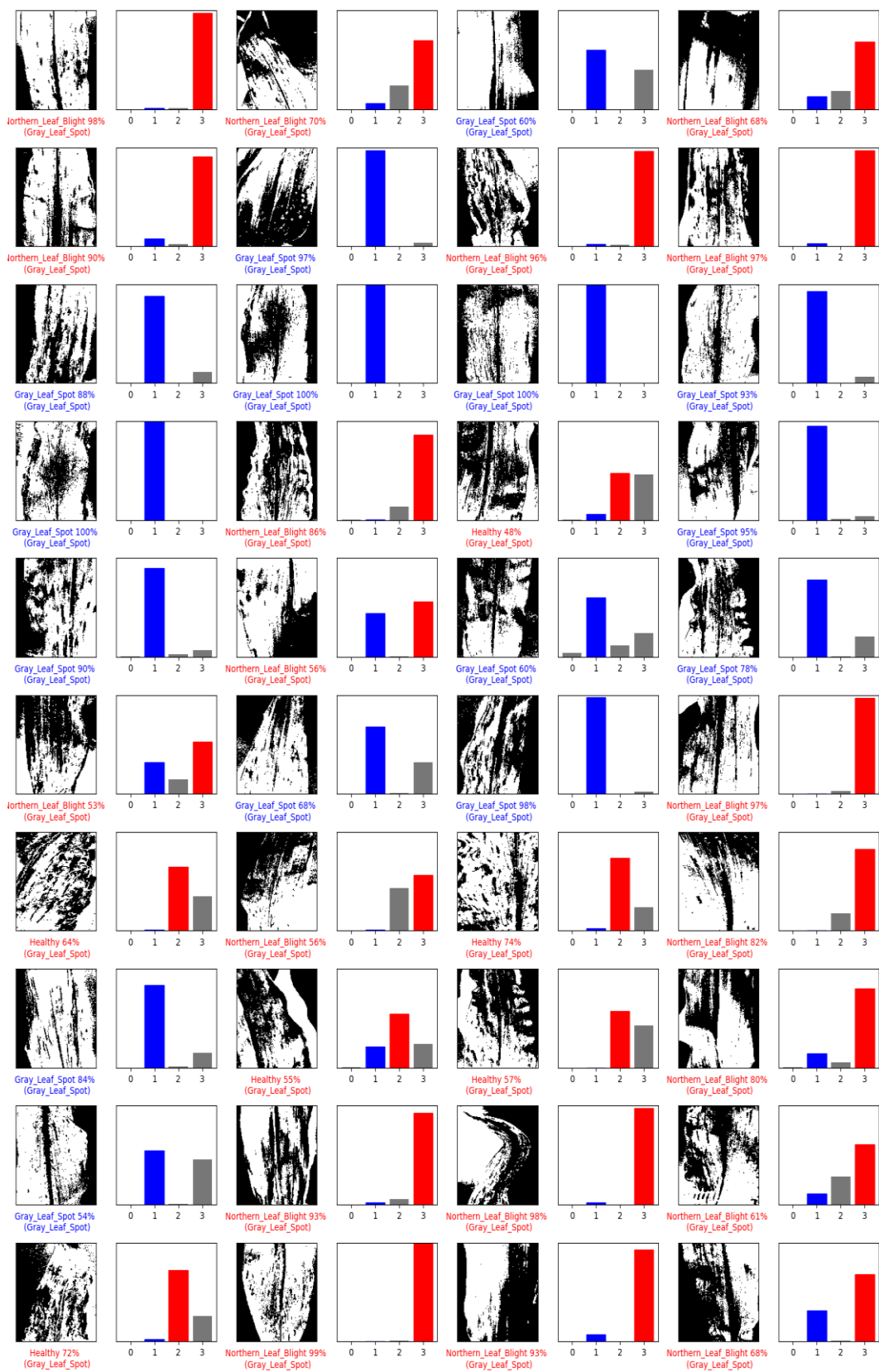
## Lampiran 5. Hasil Deteksi Seluruh Dataset *Testing* dengan *FCM+LSTM*



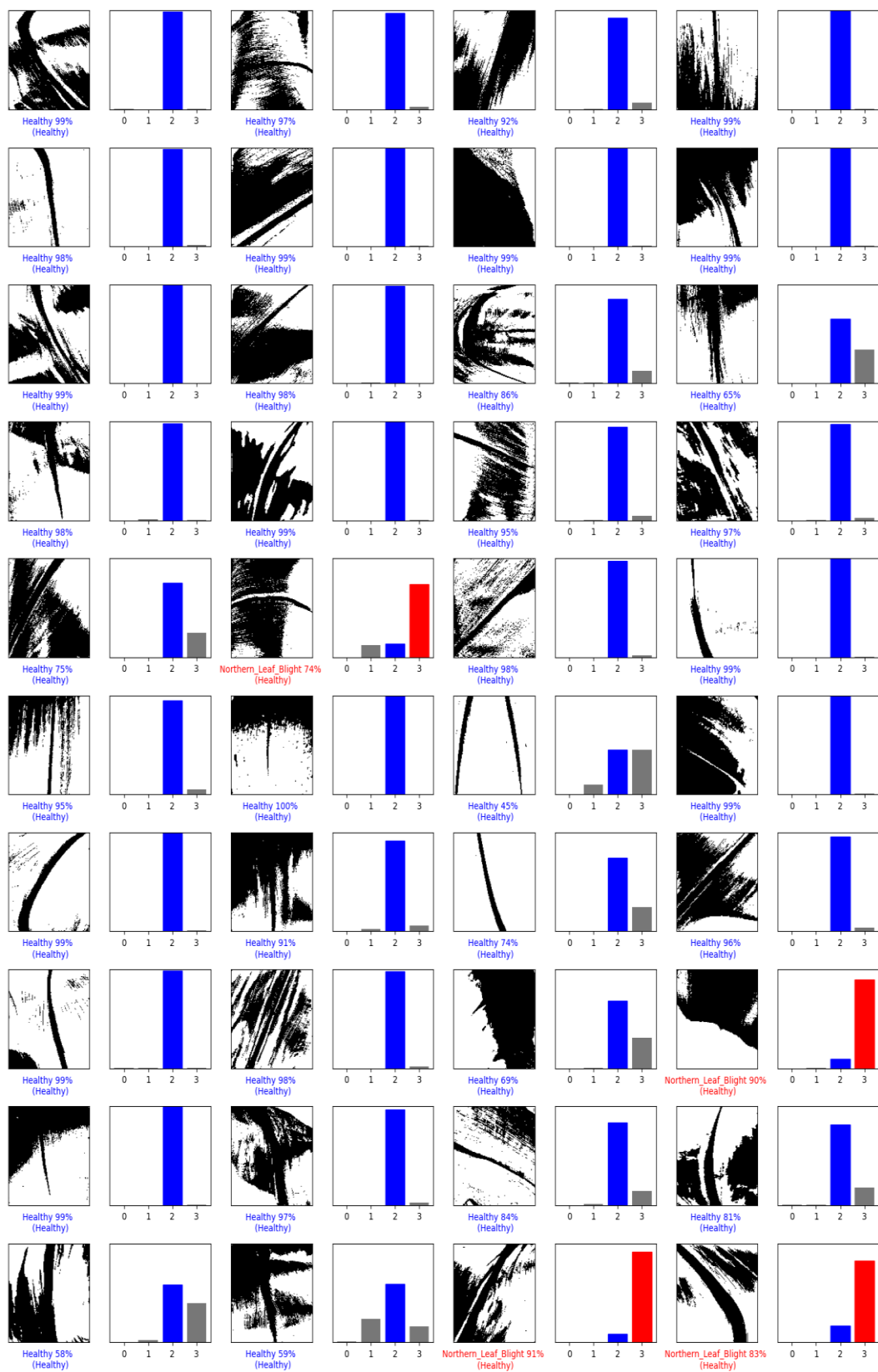


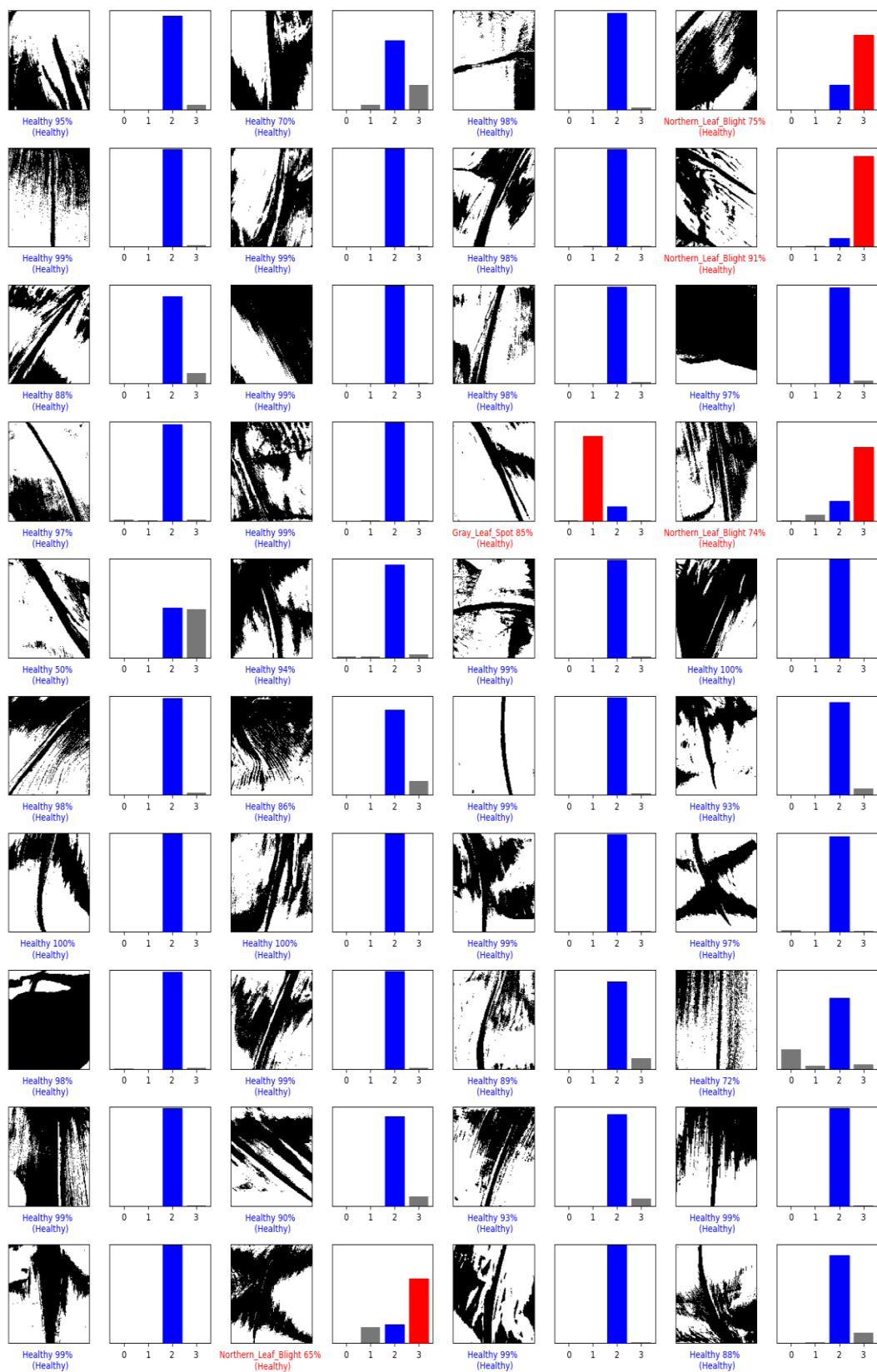


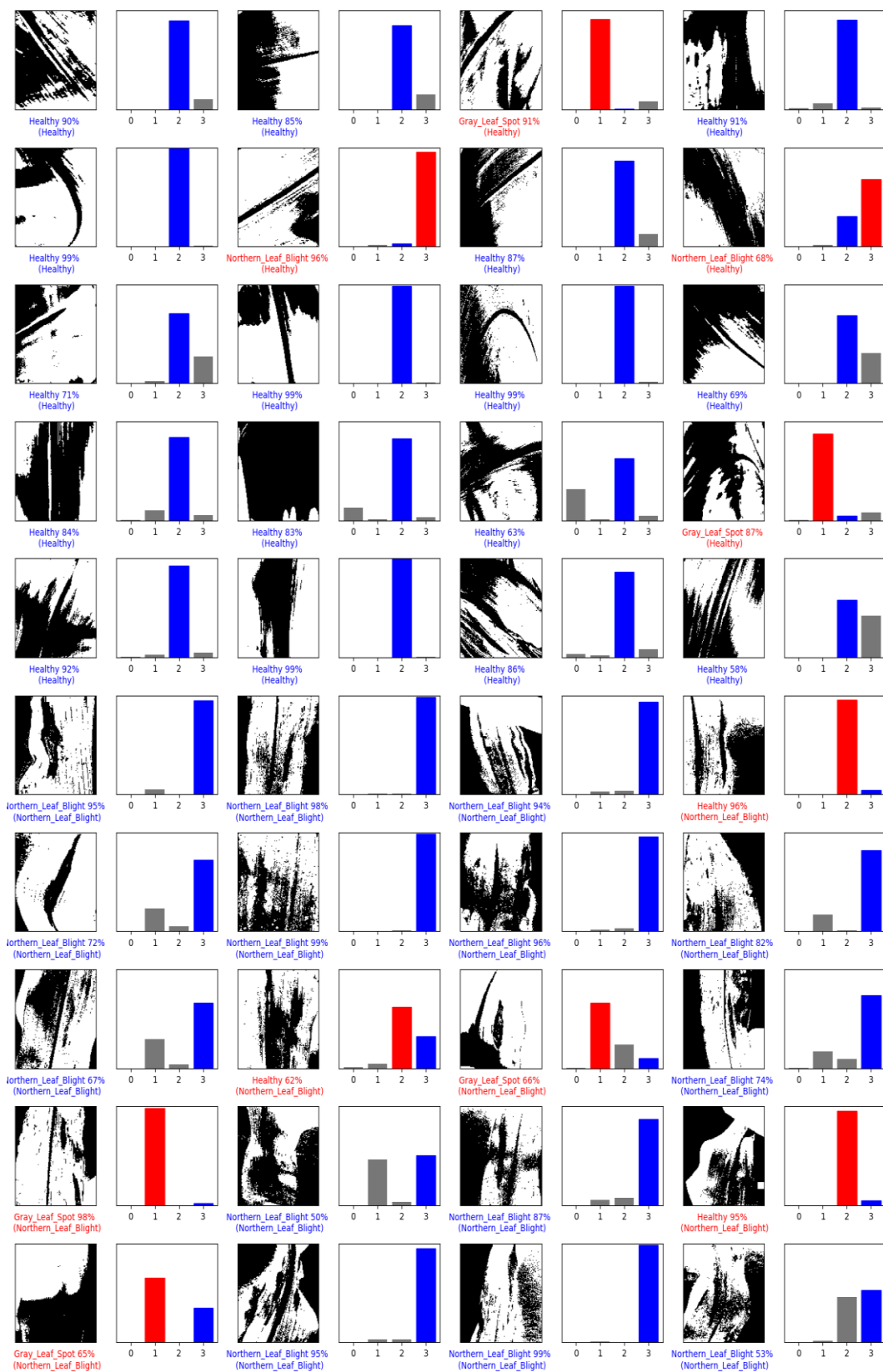


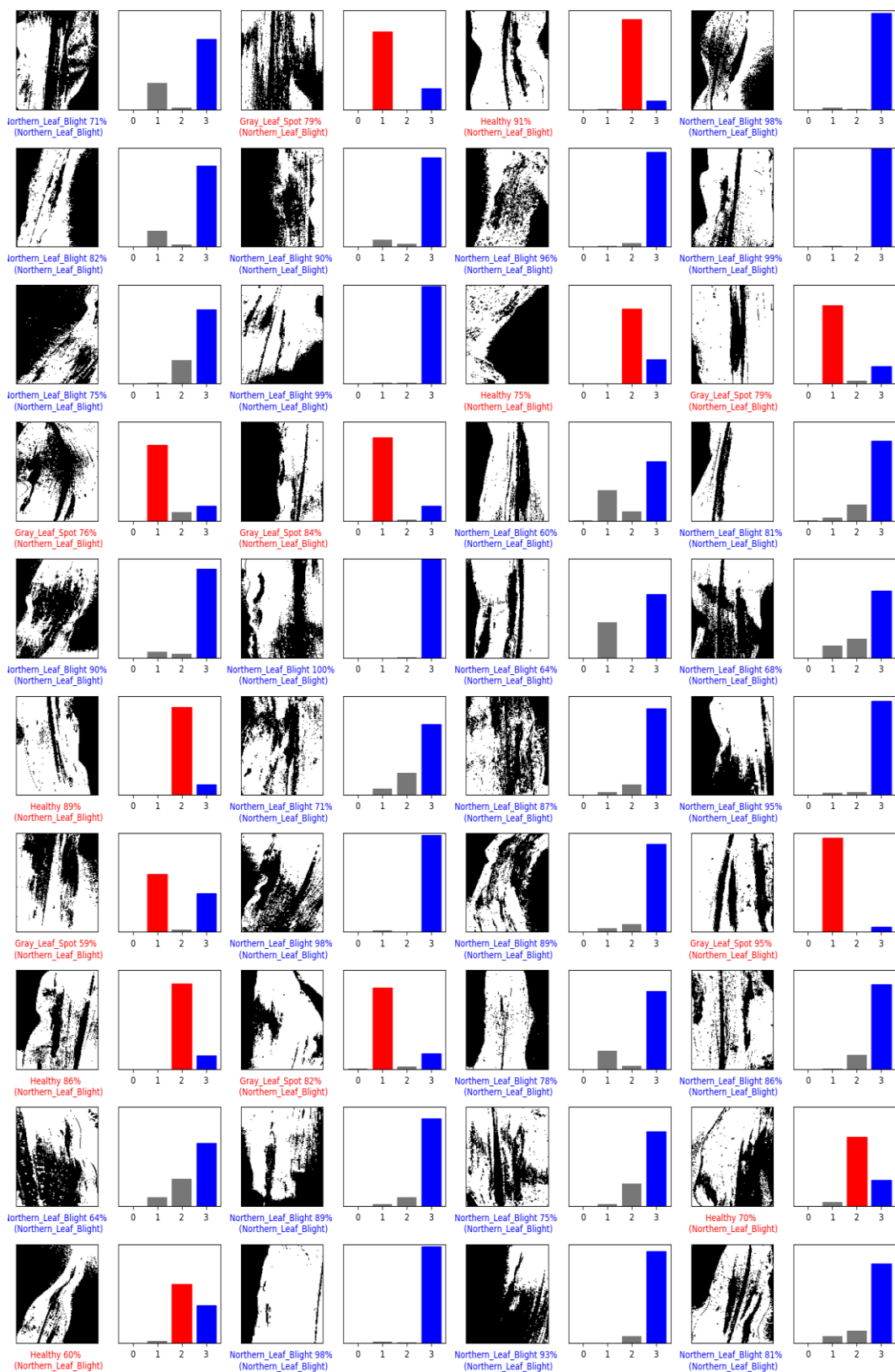


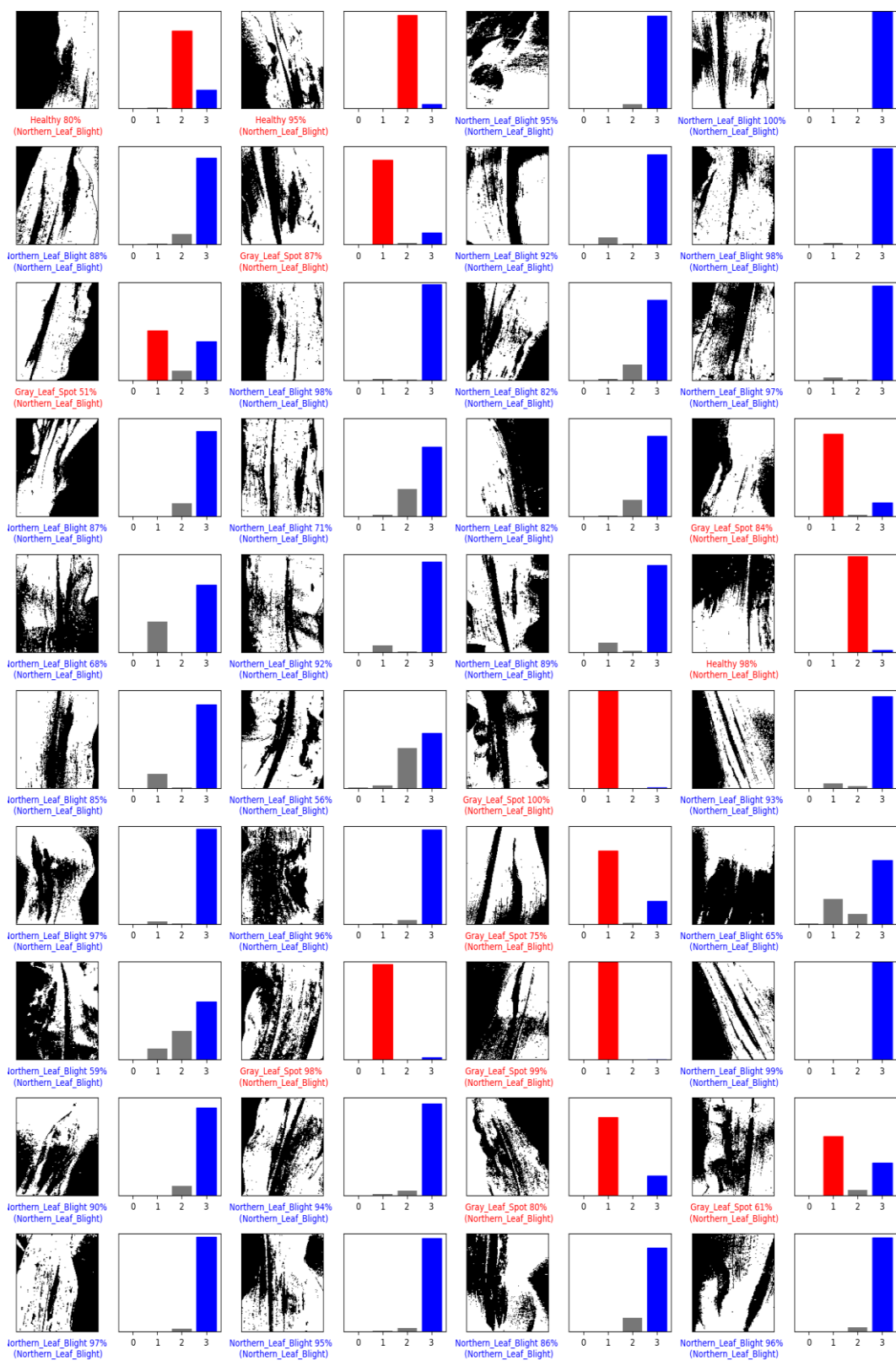












## Lampiran 6. Hasil Evaluasi *FCM+LSTM* Citra Cluster 1 sampai 10

Cluster 1:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.5798453092575073 - Accuracy: 74.37071204185486%
-----
> Fold 2 - Loss: 0.5484156608581543 - Accuracy: 75.97253918647766%
-----
> Fold 3 - Loss: 0.5903405547142029 - Accuracy: 72.08238244056702%
-----
> Fold 4 - Loss: 0.646202564239502 - Accuracy: 67.73455142974854%
-----
> Fold 5 - Loss: 0.8136882185935974 - Accuracy: 58.352404832839966%
-----
> Fold 6 - Loss: 0.5648934841156006 - Accuracy: 72.76887893676758%
-----
> Fold 7 - Loss: 0.6131356358528137 - Accuracy: 71.1670458316803%
-----
> Fold 8 - Loss: 0.627742350101471 - Accuracy: 69.79405283927917%
-----
> Fold 9 - Loss: 0.5979558825492859 - Accuracy: 72.24770784378052%
-----
> Fold 10 - Loss: 0.6111669540405273 - Accuracy: 70.41284441947937%
-----
Average scores for all folds:
> Accuracy: 70.4903119802475 (+- 4.602163280206215)
> Loss: 0.6193386614322662
-----
```



## Cluster 2:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.4617913067340851 - Accuracy: 85.81235408782959%
-----
> Fold 2 - Loss: 0.3636820912361145 - Accuracy: 89.70251679420471%
-----
> Fold 3 - Loss: 0.7391883730888367 - Accuracy: 81.0068666934967%
-----
> Fold 4 - Loss: 0.379550099658966 - Accuracy: 86.72769069671631%
-----
> Fold 5 - Loss: 0.44236722588539124 - Accuracy: 87.87185549736023%
-----
> Fold 6 - Loss: 0.5376746654510498 - Accuracy: 83.52402448654175%
-----
> Fold 7 - Loss: 0.35206061601638794 - Accuracy: 86.49885654449463%
-----
> Fold 8 - Loss: 0.38650986552238464 - Accuracy: 87.41418719291687%
-----
> Fold 9 - Loss: 0.46293365955352783 - Accuracy: 86.00917458534241%
-----
> Fold 10 - Loss: 0.4478161334991455 - Accuracy: 86.00917458534241%
-----
Average scores for all folds:
> Accuracy: 86.05767011642456 (+- 2.2595297409839104)
> Loss: 0.45735739469528197
-----
```

## Cluster 3:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.41771838068962097 - Accuracy: 87.18535304069519%
-----
> Fold 2 - Loss: 0.542028546333313 - Accuracy: 79.86270189285278%
-----
> Fold 3 - Loss: 0.576077938079834 - Accuracy: 85.35469174385071%
-----
> Fold 4 - Loss: 0.4453537166118622 - Accuracy: 82.6086938381195%
-----
> Fold 5 - Loss: 0.47234368324279785 - Accuracy: 87.18535304069519%
-----
> Fold 6 - Loss: 0.5015285611152649 - Accuracy: 85.81235408782959%
-----
> Fold 7 - Loss: 0.4362132251262665 - Accuracy: 85.81235408782959%
-----
> Fold 8 - Loss: 0.44796475768089294 - Accuracy: 87.41418719291687%
-----
> Fold 9 - Loss: 0.438360333442688 - Accuracy: 85.3210985660553%
-----
> Fold 10 - Loss: 0.5551241040229797 - Accuracy: 84.17431116104126%
-----
Average scores for all folds:
> Accuracy: 85.0731098651886 (+- 2.2286110700198196)
> Loss: 0.483271324634552
-----
```

#### Cluster 4:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.4750917851924896 - Accuracy: 81.23570084571838%
-----
> Fold 2 - Loss: 0.6015902161598206 - Accuracy: 81.69336318969727%
-----
> Fold 3 - Loss: 0.49827510118484497 - Accuracy: 79.17619943618774%
-----
> Fold 4 - Loss: 0.3451472818851471 - Accuracy: 89.24484848976135%
-----
> Fold 5 - Loss: 0.473037987947464 - Accuracy: 81.69336318969727%
-----
> Fold 6 - Loss: 0.47635212540626526 - Accuracy: 82.15103149414062%
-----
> Fold 7 - Loss: 0.48749569058418274 - Accuracy: 82.15103149414062%
-----
> Fold 8 - Loss: 0.4006407856941223 - Accuracy: 87.41418719291687%
-----
> Fold 9 - Loss: 0.5318633317947388 - Accuracy: 82.79816508293152%
-----
> Fold 10 - Loss: 0.47217875719070435 - Accuracy: 83.02752375602722%
-----
Average scores for all folds:
> Accuracy: 83.05854141712189 (+- 2.847467330163098)
> Loss: 0.47616730630397797
-----
```

#### Cluster 5:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.471319317817688 - Accuracy: 82.83752799034119%
-----
> Fold 2 - Loss: 0.43158063292503357 - Accuracy: 84.21052694320679%
-----
> Fold 3 - Loss: 0.5514038801193237 - Accuracy: 80.77803254127502%
-----
> Fold 4 - Loss: 0.4387477934360504 - Accuracy: 81.92219734191895%
-----
> Fold 5 - Loss: 0.5146916508674622 - Accuracy: 77.57437229156494%
-----
> Fold 6 - Loss: 0.4226725697517395 - Accuracy: 85.35469174385071%
-----
> Fold 7 - Loss: 0.4439294934272766 - Accuracy: 83.98169279098511%
-----
> Fold 8 - Loss: 0.4632754325866699 - Accuracy: 83.29519629478455%
-----
> Fold 9 - Loss: 0.5469337105751038 - Accuracy: 81.88073635101318%
-----
> Fold 10 - Loss: 0.5133715271949768 - Accuracy: 79.58715558052063%
-----
Average scores for all folds:
> Accuracy: 82.1422129869461 (+- 2.217334299758397)
> Loss: 0.4797926008701324
-----
```

## Cluster 6:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.48476284742355347 - Accuracy: 79.40503358840942%
-----
> Fold 2 - Loss: 0.4880872070789337 - Accuracy: 82.15103149414062%
-----
> Fold 3 - Loss: 0.5225878357887268 - Accuracy: 74.82837438583374%
-----
> Fold 4 - Loss: 0.5290654301643372 - Accuracy: 76.8878698348999%
-----
> Fold 5 - Loss: 0.453607439994812 - Accuracy: 83.29519629478455%
-----
> Fold 6 - Loss: 0.6121188998222351 - Accuracy: 74.59954023361206%
-----
> Fold 7 - Loss: 0.5064456462860107 - Accuracy: 75.51487684249878%
-----
> Fold 8 - Loss: 0.5847160816192627 - Accuracy: 72.99771308898926%
-----
> Fold 9 - Loss: 0.5634069442749023 - Accuracy: 75.68807601928711%
-----
> Fold 10 - Loss: 0.5685946941375732 - Accuracy: 76.60550475120544%
-----
Average scores for all folds:
> Accuracy: 77.19732165336609 (+- 3.1960733795012413)
> Loss: 0.5313393026590347
-----
```

## Cluster 7:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.537835955619812 - Accuracy: 77.80320644378662%
-----
> Fold 2 - Loss: 0.5519831776618958 - Accuracy: 81.0068666934967%
-----
> Fold 3 - Loss: 0.4979998469352722 - Accuracy: 81.92219734191895%
-----
> Fold 4 - Loss: 0.4317896068096161 - Accuracy: 81.23570084571838%
-----
> Fold 5 - Loss: 0.4853517413139343 - Accuracy: 80.54919838905334%
-----
> Fold 6 - Loss: 0.42513424158096313 - Accuracy: 81.46452903747559%
-----
> Fold 7 - Loss: 0.64388507604599 - Accuracy: 67.96338558197021%
-----
> Fold 8 - Loss: 0.4209536015987396 - Accuracy: 83.98169279098511%
-----
> Fold 9 - Loss: 0.5629783272743225 - Accuracy: 76.83486342430115%
-----
> Fold 10 - Loss: 0.5342767238616943 - Accuracy: 76.60550475120544%
-----
Average scores for all folds:
> Accuracy: 78.93671452999115 (+- 4.295076688492678)
> Loss: 0.509218829870224
-----
```

## Cluster 8:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.5624567270278931 - Accuracy: 75.2860426902771%
-----
> Fold 2 - Loss: 0.5361986756324768 - Accuracy: 76.6590416431427%
-----
> Fold 3 - Loss: 0.6031486392021179 - Accuracy: 72.76887893676758%
-----
> Fold 4 - Loss: 0.5151259303092957 - Accuracy: 77.80320644378662%
-----
> Fold 5 - Loss: 0.642133891582489 - Accuracy: 69.5652186870575%
-----
> Fold 6 - Loss: 0.5392659902572632 - Accuracy: 78.2608687877655%
-----
> Fold 7 - Loss: 0.47543567419052124 - Accuracy: 80.32036423683167%
-----
> Fold 8 - Loss: 0.5511380434036255 - Accuracy: 78.48970293998718%
-----
> Fold 9 - Loss: 0.4728258550167084 - Accuracy: 79.81651425361633%
-----
> Fold 10 - Loss: 0.5434277653694153 - Accuracy: 76.83486342430115%
-----
Average scores for all folds:
> Accuracy: 76.58047020435333 (+- 3.1290764647850087)
> Loss: 0.5441157191991806
-----
```

## Cluster 9:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.5113115906715393 - Accuracy: 78.03203463554382%
-----
> Fold 2 - Loss: 0.5764869451522827 - Accuracy: 75.97253918647766%
-----
> Fold 3 - Loss: 0.5174606442451477 - Accuracy: 78.48970293998718%
-----
> Fold 4 - Loss: 0.46006840467453003 - Accuracy: 81.46452903747559%
-----
> Fold 5 - Loss: 0.5302509069442749 - Accuracy: 77.34553813934326%
-----
> Fold 6 - Loss: 0.4331352114677429 - Accuracy: 80.77803254127502%
-----
> Fold 7 - Loss: 0.5798743367195129 - Accuracy: 75.97253918647766%
-----
> Fold 8 - Loss: 0.5560034513473511 - Accuracy: 75.51487684249878%
-----
> Fold 9 - Loss: 0.5920711159706116 - Accuracy: 67.66055226325989%
-----
> Fold 10 - Loss: 0.621727705001831 - Accuracy: 69.72476840019226%
-----
Average scores for all folds:
> Accuracy: 76.09551131725311 (+- 4.170125653731174)
> Loss: 0.5378390312194824
-----
```

## Cluster 10:

```
-----
Score per fold
-----
> Fold 1 - Loss: 0.45936521887779236 - Accuracy: 81.23570084571838%
-----
> Fold 2 - Loss: 0.5301328897476196 - Accuracy: 79.17619943618774%
-----
> Fold 3 - Loss: 0.68313068151474 - Accuracy: 70.48054933547974%
-----
> Fold 4 - Loss: 0.4325605034828186 - Accuracy: 83.06636214256287%
-----
> Fold 5 - Loss: 0.5666170716285706 - Accuracy: 75.74370503425598%
-----
> Fold 6 - Loss: 0.4598937928676605 - Accuracy: 80.77803254127502%
-----
> Fold 7 - Loss: 0.5785862803459167 - Accuracy: 73.45537543296814%
-----
> Fold 8 - Loss: 0.49911436438560486 - Accuracy: 80.54919838905334%
-----
> Fold 9 - Loss: 0.592587947845459 - Accuracy: 73.39449524879456%
-----
> Fold 10 - Loss: 0.5910131931304932 - Accuracy: 72.01834917068481%
-----

Average scores for all folds:
> Accuracy: 76.98979675769806 (+- 4.252169330317353)
> Loss: 0.5393001943826675
```