In [1]:
```
from tensorflow import keras
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report
from ultralytics import YOLO
import cv2
import pickle
from pathlib import Path
import matplotlib.pyplot as plt

import numpy as np
import os
```

```
2024-12-04 23:25:04.491262: I tensorflow/core/platform/cpu_feature_guard.cc:210] This TensorFlow binary is optimized to use available CPU instructions in performance-critical operations.
To enable the following instructions: SSE4.1 SSE4.2 AVX AVX2 FMA, in other operations, rebuild TensorFlow with the appropriate compiler flags.
```

In [2]:
```
file_path = 'best_model.keras'
print(f"File exists: {os.path.exists(file_path)}")
```

```
File exists: True
```

In [3]:
```
model = keras.models.load_model('best_model.keras')
```

In [4]:
```
X_test = np.load("./flower_species_classification/data_test.npy").T/ 255.0
t_test = np.load("./flower_species_classification/labels_test.npy")

X_test.shape
```

Out[4]:
```
(415, 270000)
```

In [6]:
```
X_test = X_test.reshape((X_test.shape[0], 300, 300, 3))
t_pred = model.predict(X_test)

t_pred_list = []
for i in t_pred:
    t_pred_list.append(np.argmax(i))
t_pred = np.array(t_pred_list)
accuracy = accuracy_score(y_pred=t_pred, y_true=t_test)
print(f"Accuracy is {accuracy}")
```

```
13/13 ━━━━━━━━━━━━━━━━━━━━ 136s 11s/step
Accuracy is 0.8506024096385543
```

In [7]:
```
confusionMatrix = confusion_matrix(y_pred= t_pred, y_true = t_test)
print(confusionMatrix)
```

```
[[38  1  0  0  0  0  1  2  1  5]
 [ 0 42  0  0  1  0  0  0  1  0]
 [ 2  0 26  0  4  0  2  7  0  5]
 [ 1  0  0 35  0  0  0  0  0  0]
 [ 0  0  5  0 37  0  1  0  0  2]
 [ 6  0  0  0  2 26  0  4  2  0]
 [ 1  0  0  0  0  0 41  1  0  0]
 [ 0  0  0  0  2  0  0 35  0  0]
 [ 0  0  0  0  0  0  0  0 31  1]
 [ 1  0  0  0  0  0  1  0  0 42]]
```

In [8]:
```
classififcationReport = classification_report(y_pred= t_pred, y_true=t_test)
print(classififcationReport)
```

	precision	recall	f1-score	support
0.0	0.78	0.79	0.78	48
1.0	0.98	0.95	0.97	44
2.0	0.84	0.57	0.68	46
3.0	1.00	0.97	0.99	36
4.0	0.80	0.82	0.81	45
5.0	1.00	0.65	0.79	40
6.0	0.89	0.95	0.92	43
7.0	0.71	0.95	0.81	37
8.0	0.89	0.97	0.93	32
9.0	0.76	0.95	0.85	44
accuracy			0.85	415
macro avg	0.87	0.86	0.85	415
weighted avg	0.86	0.85	0.85	415

In [ ]: