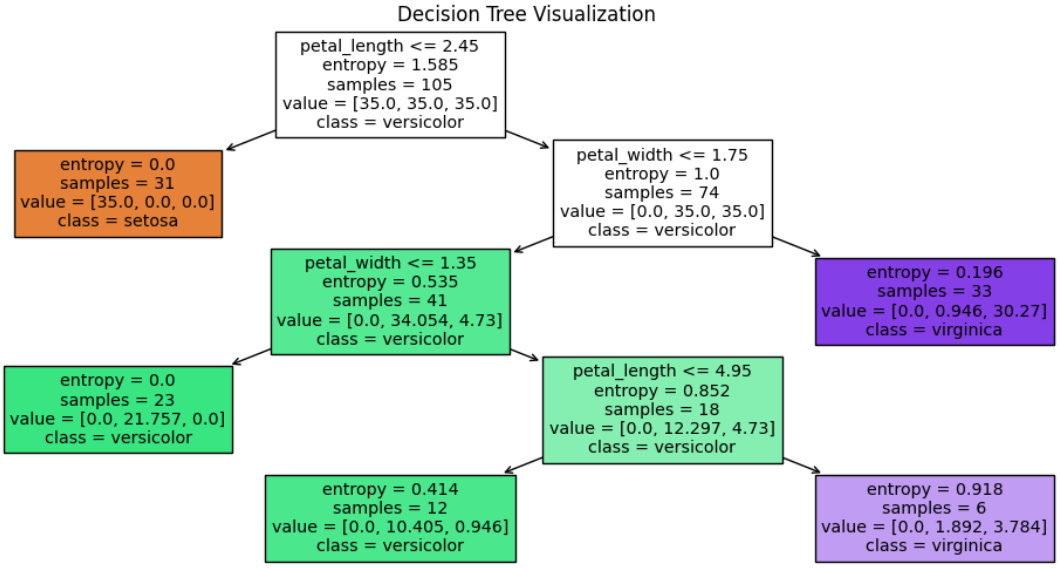
In [37]:

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier, plot_tree
import matplotlib.pyplot as plt

# Load the dataset
data = pd.read_csv('IRIS_DATASET.csv')

# Prepare features and target variable
x = data.iloc[:, :-1]  # Features: all columns except the last one
y = data.iloc[:, -1]   # Target: last column

# Split the dataset into training and testing sets
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size= 0.3, random_state=

# Create and train the Decision Tree classifier
model = DecisionTreeClassifier(
    criterion='entropy',          # Splitting criterion
    max_depth= 5,                 # Maximum depth of the tree
    min_samples_split=8,         # Minimum samples required to split an internal node
    min_samples_leaf=5,           # Minimum samples required to be at a leaf node
    max_features='sqrt',          # Number of features to consider for the best split
    max_leaf_nodes=5,            # Limit the number of leaf nodes
    class_weight='balanced',       # Weights associated with classes
    random_state=42,              # Seed for reproducibility
    ccp_alpha=0.01                # Complexity parameter for pruning
)
model.fit(x_train, y_train)

# Make predictions
y_pred = model.predict(x_test)

# Visualize the Decision Tree
plt.figure(figsize=(15, 6))
plot_tree(model, filled=True, feature_names=x.columns, class_names=model.classes_)
plt.title('Decision Tree Visualization')
plt.show()

unseen_data = [[5.7, 3.5, 2.65, 0.2]]
predictions = model.predict(unseen_data)

print('Predictions for Unseen Data:')
print(predictions)
```




```
Predictions for Unseen Data:
['versicolor']
/usr/local/lib/python3.8/dist-packages/sklearn/base.py:465: UserWarning: X does not have
valid feature names, but DecisionTreeClassifier was fitted with feature names
  warnings.warn(
```

In [ ]: