```python
import pandas as pd
from sklearn.tree import DecisionTreeClassifier, export_graphviz
from sklearn.model_selection import train_test_split, cross_val_score,cross_val_predict
import graphviz
import re
from sklearn.metrics import accuracy_score, precision_score, recall_score, classification_report
import warnings
```

```python
warnings.filterwarnings("ignore")

data = pd.read_csv("dimension.csv")

data['label'] = data['label'].apply(lambda x: re.sub(r'\s+\d+$', '', x))
X = data.drop(columns='label')
y = data['label']
```

```python
classify = DecisionTreeClassifier(criterion='gini',max_leaf_nodes=12).fit(X,y)

data = export_graphviz(classify, out_file=None,
                       feature_names=X.columns,
                       class_names=classify.classes_,
                       filled=True, rounded=True,
                       special_characters=True)
graph=graphviz.Source(data)
graph.render(filename='graph', format='png', cleanup=True)
```

```
'graph.png'
```

```python
accuracy = cross_val_score(classify, X, y, cv=5, scoring='accuracy')
precision = cross_val_score(classify, X, y, cv=5, scoring='precision_macro')
recall = cross_val_score(classify, X, y, cv=5, scoring='recall_macro')
y_pred = cross_val_predict(classify, X, y, cv=5)
```

```python
accuracy_mean = accuracy.mean()
precision_mean = precision.mean()
recall_mean = recall.mean()
classification_report_str = classification_report(y, y_pred)

print(f'Accuracy: {accuracy_mean:.4f}')
print(f'Precision: {precision_mean:.4f}')
print(f'Recall: {recall_mean:.4f}')
print('Classification Report:')
print(classification_report_str)
```

```
Accuracy: 0.3333
Precision: 0.2870
Recall: 0.3778
Classification Report:
                       precision    recall  f1-score   support

     black sea sprat        0.80      0.80      0.80         5
     gilt head bream        0.67      0.40      0.50         5
     hourse mackerel        0.40      0.40      0.40         5
          red mullet        0.00      0.00      0.00         5
       red sea bream        0.22      0.40      0.29         5
           sea brass        0.17      0.20      0.18         5
              shrimp        0.25      0.20      0.22         5
 stripped red mullet        0.00      0.00      0.00         5
               trout        0.80      0.80      0.80         5

            accuracy                            0.36        45
           macro avg        0.37      0.36      0.35        45
        weighted avg        0.37      0.36      0.35        45
```