OP130

The Landmarks Prediction for streaked gurnard *Chelidonichthys lastoviza* using Artificial Neural Networks

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Aim of the study: The aim of this study is prediction of landmarks on streaked gurnard*Chelidonichthys lastoviza*using artificial neural networks which consist of two phases,image processing and prediction of landmarks. In first phase, image processing methods were applied to images in order to find fish object on image and then extract some species specific features. Artificial neural network was used for predicting landmark location on image using the features. After prediction, the landmarks were used to calculate morphometric measurements on the shape.

Material and Methods: In this study, 77 images of *Chelidonichthys lastoviza* were used to construct the proposed model. 14 landmarks were marked on each image for the prediction of*C. lastoviza*. Artificial neural network (ANN) was used as prediction tools in this study. ANN is includes units corresponding neurons of biological neural network. There are input and output layers in an ANN with adjustable weights, and each neuron unit of these layers produces an output value which calculated via a function of the sum of its inputs.
Some image processing methods shuc as noise filter, edge detection, filling operation etc. were applied on the images. After this step, the fish objects were detected which was called ROI ragio of interest. Then, some features were extracted from ROI on the images. The extracted features, which are centroid, area orientated and extreme points of object, are used as input parameter in the neural network. Fourteen landmark locations were determined for *C. lastoviza*. The neural network was constructed as two hidden layer with 20 neurons to predict 14 landmarks marked on each image. Networks were trained using extracted features.

Results: It is aimed to develop an algorithm to facilitate shape analyses of fish species. The algorithm can be used to get landmark location and to calculate morphometric measurements of shape. The algorithm automatically determines these landmarks by using image processing techniques and neural network. Actual average size of *C. lastoviza* was about 15cm. The average prediction errors were 0.225 cm of all landmarks. Some landmark prediction error was about 0.034 cm. However, some landmark prediction error was 0.423 cm. These results show that the algorithm automatically predicts landmarks by using image processing techniques and neural network.

Keywords: Morphology, Landmarks, Neural Networks, Prediction, Triglidae, Chelidonichthys lastoviza.

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