

1142-92-205

Binod Regmi* (binodregmi30@gmail.com), 1551 N Leverett Ave 52, FAYETTEVILLE, AR 72703, and **Marlis Douglas** and **Michael Douglas**. *Machine learning on morphometry, an evaluation of classifiers' performance on closely related species delimitation.*

Learning algorithms have been implemented to investigate communities of different fish species in natural habitats; however, the potentiality of the algorithms to discriminate closely related species has not been examined yet. In this study, we digitized 18 anatomical landmarks from 564 images captured from museum specimens of five fish species collected in the Central Himalayas. Landmarks co-ordinates (2D) were transformed using Generalized Procrustes Alignment (GPA). Principal component analysis with logistic regression, linear discriminant analysis, support vector machine learning, and random forest approaches were evaluated for their performance to discriminate putative endemic species of snowtrout in Lake Rara and two other common species of snowtrout found in major rivers in the Central Himalayas. To get an insight on model performance, we implemented multistage error estimation and cross-validation from data extraction through analysis. We compared MNOVA, accuracy estimates, and area under ROC for evaluating the machine learning algorithms. Both support vector machine and linear discriminant analysis as performing well for distinguishing species. This study demonstrates the prospect of developing automatized species recognition systems using popular statistical algorithms. (Received September 04, 2018)