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### The shell of the whelk *Buccinum undatum* L.

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## Summary

In order to reveal the character of shape features of gastropod shells, specimens of *Buccinum undatum* L. are examined. In gastropods, found empty so often in sediments, shape features are most important data.

The shell is analyzed in order to investigate the relations between characteristics of the soft body and shape elements of the shell; sexual dimorphism being the main interest. Until now criteria for describing and interpreting dimorphism in empty shells did not give reliable results.

The whelks have been collected alive in their natural surroundings and, after discarding the animal, have been marked according to sex and locality.

A special measuring device meeting the demands of the shell's shape (measurement in cylindrical coordinates) is used to measure the shells along a frame-pattern of selected lines. This frame-pattern has been designed such that, with the help of measurements following the pattern lines, it is possible to make a spatial reconstruction of the shell.

The measurement data have been processed by computer. Graphical reconstructions of frame-pattern lines are used to reveal shape differences between male and female shells.

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works to reveal shape differences  
between shells.

Projections of the aperture, either into vertical  
and horizontal planes or into oblique planes,  
indicate a difference in shape between female and  
male shells in the upper half of the aperture.  
This difference seems to be general, but it is small  
and obscured by variation. Individual shells can-  
not be sexed (identified according to their sex)  
on the strength of these plots.

A multivariate statistical approach has been  
chosen to make recognition of the intrinsic sexual  
shape characteristics possible. Measurement data  
of the aperture are processed such that the spot-  
ted differences are described numerically and  
then subjected to discriminant analysis. This is  
a method to analyze differences between groups and  
classify specimens into one of these groups by  
means of the analyzed differences.

The analysis, applied on two samples of 140 spe-  
cimens each from two locations, reveals that a  
large proportion (75% and 85% respectively in the  
two samples) of specimens of unknown sex can be  
sexed in this way. When the samples are mixed  
still 65% of specimens of unknown sex can be sexed  
on the strength of shape characteristics derived  
from specimens from the other locality.

The analysis also showed that shape characteristics  
bear information on the locality. So the aperture,  
that part of the shell that is nearest to the  
sexual organs of the soft body, is not only sexual-  
ly dimorph, its shape proves to be dependent on  
locality too.