

Steidinger, K., J. Landsberg, R. W. Richardson, E. Truby, B. Blakesley, P. Scott, P. Tester, T. Tengs, P. Mason, S. Morton, D. Seaborn, W. Litaker, K. S. Reece, D. Oldach, L. Haas and G. Vasta (2001). "Classification and identification of *Pfiesteria* and *Pfiesteria*-like species." Environmental Health Perspectives **109**(Supplement 5): 661-665.

Dinoflagellates can be classified both botanically and zoologically; however, they are typically put in the botanical division Pyrrhophyta. As a group they appear most related to the protistan ciliates and apicomplexans at the ultrastructure level. Within the Pyrrhophyta are both unarmored and armored forms of the dominant, motile flagellated stage. Unarmored dinoflagellates do not have thecal or wall plates arranged in specific series, whereas armored species have plates that vary in thickness but are specific in number and arrangement. In armored dinoflagellates, the plate pattern and tabulation is a diagnostic character at the family, subfamily, and even genus levels. In most cases, the molecular characterization of dinoflagellates confirms the taxonomy on the basis of external morphology; this has been demonstrated for several groups. Together, both genetic and morphological criteria are becoming increasingly important for the characterization, separation, and identification of dinoflagellates species. *Pfiesteria* and *Pfiesteria*-like species are thinly armored forms with motile dinospore stages characterized by their distinct plate formulae. *Pfiesteria piscicida* is the best-known member of the genus; however, there is at least one other species. Other genetically and morphologically related genera, now grouped under the common names of "Lucy," "Shepherd's crook," and cryptoperidiniopsoid, are being studied and described in separate works. All these other heterotrophic dinoflagellate groups, many of which are thought to be benign, co-occur in estuarine waters where *Pfiesteria* has been found.