

SANDSTONE PETROGRAPHY OF LOWER DEVONIAN ORISKANY SANDSTONE AND CORRELATIVE UNITS OF THE APPALACHIAN BASIN, NEW YORK TO WEST VIRGINIA

³Roland Scal and ^{1,2}Gerald M. Friedman

¹*Department of Geology, Brooklyn College and Graduate Center of the City University of New York, Brooklyn, NY 11210 USA*

²*Northeastern Science Foundation, Inc., affiliated with Brooklyn College, Rensselaer Center of Applied Geology, Troy, NY 12181; For correspondence: Northeastern Science Foundation, 15 Third Street, P.O. Box 746, Troy, NY 12181, USA; gmfriedman@juno.com*

³*Current Address: Queensborough Community College, Dept of Biological Science and Geology, 222-05 56th Ave, Bayside, NY 11364*

ABSTRACT: The Oriskany is a quartzarenite from New York to southern Virginia, suggesting it was derived from similar sources along its entire extent. Its detritus was derived from mineralogically mature eastern borderland and stable platform sources. Three petrographically different depocenters are evident. Differences in abundance of siliclastic grains and varietal study of tourmaline overgrowths revealed a southern reworked highly abraded, low-vanadian tourmaline provenance from east central Pennsylvania to West Virginia (southern region), a central tourmaline overgrowth-free provenance from east central Pennsylvania to southeastern New York (central region) with no feldspar. The central region is dominated by quartzose conglomeratic and coarse-grained quartzarenites units and is most likely derived from older units of the Reading Prong and Paleozoic rocks from southeastern New York. Sandy limestones of southeastern New York have a similar detrital provenance and lack authigenic tourmaline. A slightly to moderately abraded vanadian-rich overgrowth tourmaline provenance occurs in central and southwestern New York (northern region) with traces of alkali-feldspar often overgrown by orthoclase.

A similar mineralogy and general paragenesis was found for the southern and northern regions, but feldspar overgrowths are lacking in the southern region. Quartz overgrowths form the major cement in both northern and southern regions, while in the central region many sandstones have only minor quartz overgrowths and appear to have been lithified by strong compaction. Green Pond Outlier samples lack quartz overgrowths, and early brittle fracture followed by a later nonsynaxial silica cement results in quartzite texture.

Though some moderately early calcite cement is present in both southern and northern regions, ferroan calcite and dolomite are more important.

In both the southern and northern regions colorless overgrowth tourmaline is syntaxial schorl-dravite $[\text{Na}(\text{Fe}, \text{Mg})_3\text{Al}_6(\text{BO})_3\text{Si}_6\text{O}_{27}(\text{O}, \text{OH}, \text{F})]$. Only quartz overgrowths are intergrown with tourmaline overgrowths, no evidence indicates formation in the sandstone; these composite grains can survive reworking and have been found in lower Middle Devonian units. Intergrown tourmaline and quartz grains suggest that both minerals formed in quartz-rich rocks, most probably older Paleozoic sandstones that are known to contain authigenic tourmaline. Examples of nearly euhedral tourmaline reworked overgrowths have been found and prior assertions that authigenic tourmaline forms in the Oriskany Sandstone are refuted here.

LOWER PALEOZOIC CARBONATE ROCKS OF EASTERN AND SOUTHEASTERN NEW YORK STATE: FURTHER DISCUSSION

¹Gerald M. Friedman, ²John E. Sanders, and ¹Baiying Guo

¹Department of Geology, Brooklyn College and Graduate Center of the City University of New York, Brooklyn, NY 11210; Northeastern Science Foundation, Inc., affiliated with Brooklyn College, Rensselaer Center of Applied Geology, Troy, NY 12181; For correspondence: Northeastern Science Foundation, 15 Third Street, P.O. Box 746, Troy, NY 12181, USA; gmfriedman@juno.com

²Deceased 2000

INTRODUCTION: In this introduction, we present a discussion of our geologic results under the headings of stratigraphy, microlithofacies, geological structure, burial history and diagenesis, and perspectives on petroleum exploration as a supplement to our previous paper (Friedman and Sanders 2001).
