

Sydney Basin in the Triassic—a review of the geology, flora and fauna, and ecosystems. The Wianamatta Group

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ABSTRACT. As the town of Sydney grew in the 1800's the search for building material and the later construction of railways in the colony revealed an extensive trove of Triassic fossils. Many were passed to and held in scientific collections to later be described. The Australian Museum was one of the institutions which progressively built an extensive and diverse collection of this material. Drawing primarily on these resources, this study reviewed all known flora and fauna of the Middle Triassic Wianamatta Group of the Sydney Basin. Each taxon is illustrated, and a brief taxonomic history is included. To allow efficient access to specimens, museum registration numbers are listed and specimens' positions in the collection noted. The range of the known biodiversity encompasses three temnospondyls, twelve fishes, fourteen insects, five crustaceans, two molluscs and two plants recovered from different sites across the basin. In some cases, this study also includes specimens and images from the Geological Survey of New South Wales, the Queensland Museum and the Natural History Museum, London. To place the collection in context, particularly for educators working with students, a brief geological description and inferred ecosystems of the Wianamatta Group are included.

Introduction

The Triassic rock succession of the Sydney Basin comprises three major divisions: the Narrabeen Group, the Hawkesbury Sandstone and the Wianamatta Group. Previous studies have covered the Narrabeen Group (McLean, 2023) and the Hawkesbury Sandstone (McLean, 2024). The Wianamatta Group is the final Triassic depositional episode of the Sydney Basin. The sedimentary succession of this major regression includes shoreline and alluvial sedimentary layers. Meandering streams flowed down from the northwest forming flood outwash basins, levees and backswamps (Herbert, 1980a). Shales, formed by the lagoonal and peat marsh environments of this Middle Triassic time, have been quarried, and transport infrastructure cuttings were often driven through the Wianamatta shales. These activities revealed fossils, many of which are now housed in the Australian Museum.

The aims of this study were to: 1) summarise the geological construction of the Wianamatta Group, 2) provide details of all plant and animal fossil taxa discovered within the region, 3) provide details of the collection locations, and 4) make inferences about the palaeoecosystems within the region based on the flora and fauna discovered so far.

The initial section of this report is a brief summary of the geology of the Wianamatta Group. The core section of this report, “Flora and Fauna”, is a summary description of every taxon described or identified in the Wianamatta Group fossil collection of the Australian Museum, as well as of the Geological Survey of New South Wales, the Queensland Museum and the Natural History Museum, London. An image of each taxon is included. The fauna of this time ranges from the vertebrates (amphibians and fishes), to the invertebrates (insects, other arthropods, crustaceans and molluscs). The flora includes lycopsids, horsetails, seed ferns, ferns and conifers.

Keywords: Sydney Basin, Triassic; Wianamatta Group; fossil sites; fossil fish; fossil plants; fossil insects; temnospondyl; crustacean, mollusc
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