Brain stroke is the third leading cause of death in developed countries. The central nerve system of the patient is damaged as a consequence of the occurrence of ischemic condition in the brain. Oxygen and glucose deprivation (OGD) model of Neuro-2a nerve cells is a recognized model in the screening of materials for protecting brain from ischemic damage. Some anthocyanin-rich “superfruit” juices, not including Myrica rubra juice, have been proved to be among them. Myrica rubra is a common anthocyanin-containing fruit in Southern China and Taiwan. The present study was to elucidate the neuroprotective effect of Myrica rubra juice in OGD model of Neuro-2a cells. Neuro-2a cells were seeded at a density of $5 \times 10^4$ cells per well on 96-wells microtiter plate at $37^\circ$C in 5% CO₂ atmosphere. After 24 hr, cells were preincubated with Myrica rubra juice at 0.27, 0.55, 1.09, 2.19 and 4.39 mg total solids/mL concentrations, which are equivalent to 6.25, 12.5, 25, 50 and 100 μg total anthocyanins/mL respectively, for 24 hr. The medium was then replaced with glucose-free Dulbecco's Modified Eagle Medium. Sodium hyposulfite (Na₂S₂O₄) was dissolved in phosphate-buffered saline, and added into the culture medium to 5mM concentration. The OGD experiments were then started. The culture was incubated for 60 min in an atmosphere of 1% O₂ and 5% CO₂. MTT tests were practiced to assess the cell viability as a measure of the neuroprotective effect. The tests showed no significant change in cell viability after 24 hr preincubation with Myrica rubra juice, indicating no cytotoxicity of the juice. The Neuro-2a cell viability decreased to 53.61% in the OGD experiment of the control sample. The cells underwent substantial changes in shape, becoming heterogeneous with the disappearance of axons and dendrites. In the samples added with Myrica rubra juice, the viability of cells increased in a concentration-dependent manner up to 86.7% increment. The results proved the neuroprotective effect of Myrica rubra juice in OGD nerve cell model and suggested the potential of using Myrica rubra juice in the formulation of health food for protecting brain from ischemic damage.