Nuclear envelope (NE) presents not only an efficient barrier between the two cellular compartments, the nucleus and the cytoplasm, but also mediates many cellular processes including nuclear organisation, gene positioning and transcriptional regulation, communication between nucleus and cytoplasm, etc. Therefore, resolving NE structure is crucial to understand its multiple functions. It is composed of inner and outer nuclear membrane and perforated by nuclear pore complexes (NPC) facilitating regulated transport between the nucleus and cytoplasm. In metazoans, the inner nuclear membrane is closely attached to a meshwork of intermediate filament proteins called nuclear lamina. Little is known about the NE structure and organization in plants in comparison with metazoans. By means of field emission in-lens scanning electron microscopy we observed intact nuclei of 3- and 10-day-old tobacco BY-2 cells from both the cytoplasmic and nucleoplasmic sides of the NE and described the ultrastructural details of plant nuclear pore complexes (NPCs). Importantly, we observed filamentous lattice attached to the inner nuclear membrane that was also linked to NPCs. The possibility of plant lamina existence was suggested within the context of our understanding of NE structure and function in eukaryotes. Supported by grant from the Biotechnology and Biological Sciences Research Council, UK, grant number BB/E015735/1.