The rotational spectrum of histidine, showing a complex nuclear quadrupole interactions arising from three $^{14}$N nuclei in non-equivalent positions have been resolved and completely analyzed. Solid samples (m.p. 290 °C) were vaporized by laser ablation and probed by Fourier transform microwave spectroscopy in a supersonic expansion. The experimental constants clearly lead to the unambiguous identification of the $\varepsilon$ tautomer in the gas phase.