**Abstract -** As an alternative to traditional classification methods, semi-supervised learning algorithms have become a hot topic of significant research, exploiting the knowledge hidden in the unlabeled data for building powerful and effective classifiers. In this work, a new ensemble-based semi-supervised algorithm is proposed which is based on a maximum-probability voting scheme. The reported numerical results illustrate the efficacy of the proposed algorithm outperforming classical semi-supervised algorithms in term of classification accuracy, leading to more efficient and robust predictive models.