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A framework for harmala alkaloid extraction process development using fuzzy-rough sets feature selection with fuzzy rough NN by using Weka

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Peganum harmala is a widespread species growing as wild plant in Egypt and proved to be useful as an anti-hemorrhoid, anthelmintic, and central nervous system (CNS) stimulating agent in folk medicine. Alkaloids, mainly Harmine, Harmaline, Harmol and Harmalol, represent the major active constituent of the seeds of *Peganum harmala*. Therefore optimization and development an efficient and economic method for extraction of alkaloids from its seeds will be of great importance from both medical and economic point of view. Therefore, dried powdered seeds of *Peganum harmala* were extracted using 70% methanol by the conventional maceration method. The extraction process was carried out 80 times for three runs using 11 variables including the volume and concentration of organic solvent, HCl, temperature, and pH. Using machine learning algorithms to explore most important rules affecting extraction process from complex, real data with understandable form and good classification performance is considered as a great challenge. Therefore, this study proposes a Fuzzy Rough with J48 classification model. It integrates Fuzzy Rough and J48 in three phases. The first phase is preparing the input data to construct the information table. The second phase is to reduce features to get the minimum important ones and exclude the redundant attribute for saving training time. The last phase is the classification stage which is based on J48. In the following subsections, we will introduce basic stages of our proposed technique in more detail. J48 classification algorithm is applied to the reduced feature set of Harmla Alkaloid Extraction Process. The accuracy is evaluated using 10-fold cross validation. The experimental results of this proposed intelligent model and J48 Tree view showed a better understanding tool to present the scientific rule for increasing Harmala alkaloid yield range to be around (5%).

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Anthelmintic activities of *Barleria Gibsoni* Dalz. extracts

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Different extracts of *Barleria gibsoni* Dalz. (Acanthaceae) were screened for Anthelmintic activities using Indian earthworms (*Pheretima posthuma*). The ethanol extracts exhibited significant ($p<0.01$) anthelmintic activities compared with the control and other extracts. Albendazole was used as standards for anthelmintic activity. Anthelmintic activity of ethanol and aqueous extract of *Barleria gibsoni* stem bark was shown more significant paralysis and death as compared to standard drug albendazole at different concentration 5, 10, 15mg/ml, The ethanol extract at concentration 15mg /ml showed 89min for paralysis and 132min for death and standard drug 99min for paralysis and 119min for death. The aqueous extract did not show activity. Further investigations are however necessary to explore mechanisms of action involved in these pharmacological activities and constituents responsible for the activities.

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