The developed methods can be used effectively as a mathematical model to estimate the extraction efficiency hence, can be used as an efficient extraction protocol at industrial level of the mentioned drugs.

**Conclusion**

The developed novel extraction method and analytical methods during the present studies are more efficient than the previous methods, thus can be used as promising tool for extraction at industrial level.

Ionic liquid based microwave assisted extraction (IL-MAE) method was developed for the extraction of andrographolide from *Andrographis paniculata*, piperine from *Piper nigrum* and glycyrrhetinic acid from *Glycyrrhiza glabra*. [bmim]Cl-microwave assisted extraction was proved to be better in respect of extraction efficiency, time and quantity of solvent used. The developed method can be used as an efficient extraction protocol at industrial level.

So, the developed method can be used effectively as a mathematical model to estimate the extraction efficiency hence, can be used as an efficient extraction protocol at industrial level.