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CHARACTERIZATION AND DETERMINATION OF CHEMICALS IN SUMBUL (BERBERIS LYCEUM ROYLE) THROUGH HPLC AND INSECTICIDAL ACTIVITIES AGAINST COMMON RESISTANT INSECT TRIBOLIUM CASTANEUM

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Medicinal plants have been found promising in treating diseases throughout the world. Herbal treatments are preferred over synthetic drugs due to fewer side effects as reported otherwise in terms of adverse drug reactions, drug-drug interactions and drug resistance so far. Pakistan has plenty of natural resources and is well known for their diverse and valuable medicinal plants. *Berberis lyceum* is a highly medicinal plant present widely in Pakistan and other countries. In this study, methanol and ethanol extracts of root, stem and leaves of *Berberis lyceum* were extracted through Soxhlet method. Alkaloids were isolated through high-performance liquid chromatography (HPLC) by using Si1C18 column with acetonitrile and potassium dihydrophosphate as mobile phase. The elution rate was 1.0 ml/min and the detection was monitored at 346 nm. High-performance liquid chromatography (HPLC) analysis showed berberine in crude extract of stem but root crude extracts contain high amount of berbamine and low amount of berberine, while leaf extracts showed negative results. Insecticidal activities in this study against the most common and pest resistant insect, *Tribolium castaneum*, showed good results with 20% concentration of ethanolic and methanolic crude extracts of *Berberis lyceum* with malathion combination. The insects were tested with 20% methanolic and ethanolic extracts of root stem and leaves alone and combination of extract with different concentrations

of malathion. Combination of extracts of stem and root showed maximum mortality rate as compared to crude extracts alone. Our extracts do not actually kill the insects; it can make them sensitive to any insecticide. After applying our extracts, insects can be killed from any insecticide, but leaf extracts again showed no promising results.

