Summary
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1. The seed of *Bryonia laciniosa* was evaluated for preliminary phytochemical investigations, various ash and extractive values, HPTLC fingerprinting antidiabetic and antihyperlipidemic activities.

2. Preliminary phytochemical screening indicated that the seeds of *Bryonia laciniosa* contained saponins, carbohydrates, terpenoids and steroids. HPTLC fingerprinting of the 70% alcoholic extract and its n-butanol fraction revealed the presence of saponins and bitter principles which might be responsible for the antidiabetic and antihyperlipidemic potential of the plant.

3. Our study reveals that the 70% alcoholic extract of *Bryonia laciniosa* seeds does not produce any toxicity and could be safely used for therapeutic purpose at the doses employed in the studies.

4. The antihyperglycemic and antihyperlipidemic effects were observed in the 70% alcoholic extract of *Bryonia laciniosa* seeds and its n-butanol fraction. The findings of the present study indicate a number of positive effects of the plant in rats with STZ-induced disturbances as regards to lipid profile, antioxidant status, and glucose tolerance. Thus, *Bryonia laciniosa* can be beneficial in the control of diabetes, abnormalities in lipid profiles and oxidative stress through activation of antioxidant enzymes. The possible underlying mechanism is delaying or inhibiting glucose absorption at intestinal level or decreasing the endogenous glucose production in liver.

5. The antidiabetic potential of the 70% alcoholic extract of *Bryonia laciniosa* seeds and its n-butanol fraction was studied in the neonatal STZ induced type 2 diabetic model. Significant reduction in fasting blood glucose levels were observed in the treated diabetic animals. Serum insulin levels were not altered in the animals treated with the 70% alcoholic extract and its n-butanol fraction. Hence, the antihyperglycaemic activity may be probably through an extra-pancreatic mechanism. In diabetic rats treated with the 70% alcoholic extract and its n-butanol fraction, a significant increase in activity of antioxidant enzymes was observed. This might reflect the antioxidant potency of the 70% alcoholic extract and n-butanol fraction. The reduction in blood glucose levels may prevent glycation and subsequently prevent the
inactivation of antioxidant enzymes. However, possible involvement of other mechanisms cannot be excluded at this stage.

6. Treatment with the 70% alcoholic extract and its n-butanol fraction effectively controlled the fructose-induced hyperglycemia by reducing blood glucose levels without affecting insulin levels. Thus glucose lowering effect of *Bryonia laciniosa* supports the antihyperglycemic effect observed in neonatal-STZ induced type 2 diabetes. Further, seeds of *Bryonia laciniosa* suppress the fructose induced increases in the concentration of triglycerides, cholesterol, VLDL and LDL.

7. The 70% alcoholic extract of *Bryonia laciniosa* seeds and its n-butanol fraction were found to produce beneficial effects in high fat hyperlipidemic rats and were able to ameliorate oxidative stress in these rats as evident from lowered hepatic MDA concentration.
Future Directions:

1. Diabetes is associated with declining sexual function in women and men. The seeds of *Bryonia laciniosa* are reported to be useful in curing cases of sterility. No detailed study has been carried out so far to validate the effects of *Bryonia laciniosa* as a reproductive tonic. Thus, the different studies can be planned to support the traditional uses of seeds of *Bryonia laciniosa* in diabetes associated sexual dysfunction.

2. Investigations are required to elucidate the exact mechanism of action for the efficacy of *Bryonia laciniosa* in the metabolic disorders. Attempts should be made to isolate the active principle of *Bryonia laciniosa* responsible for such activities.