Anti-diabetic Activity of *Helicteres isora* L. Bark Extracts on Streptozotocin-induced Diabetic Rats

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**Introduction**

Diabetes mellitus is a chronic metabolic disease caused by an absolute or relative lack of insulin and or reduced insulin activity, which results in hyperglycaemia and abnormalities in carbohydrate, protein and fat metabolism. Though different types of oral hypoglycaemic agents are available along with insulin for the treatment of diabetes mellitus, there is a growing interest in herbal remedies due to the side effects associated with these therapeutic agents (Kamesawara et al., 2000). The investigation of anti-diabetic agents of plant origin which are used in traditional medicine is thus of great importance.

The bark of *Helicteres isora* Linn. (Sterculiaceae) has been used in the indigenous systems of medicine in India for the treatment of diabetes mellitus since time immemorial. The plant is a shrub or small tree available in forests throughout the Central and Western India. The roots and the bark are expectorant, demulcent and are useful in colic, scabies, gastropathy, diabetes, diarrhoea and dysentery (Kirtikar & Basu, 1995). The fruits are astringent, refrigerant, stomachic, vermifugal, vulnerary, and useful in griping of bowels, flatulence of children (Chopra et al., 1956), and antispasmodic effect (Pohocha & Grampurohit, 2001). From the roots, Cucurbitacin B and isocucurbitacin B were isolated and reported to possess cytotoxic activity (Bean et al., 1985). The aqueous extract of the bark showed significant hypoglycaemic effect (Kumar et al., 2006a) and lowering effect of hepatic enzymes (Kumar et al., 2006b). The present investigation was undertaken to study the anti-diabetic effects of the aqueous bark extracts of *Helicteres isora* on streptozotocin (STZ)-induced diabetic rats.

**Materials and Methods**

Male Wistar albino rats (weighing 160–200 g) were procured from the Animal house, Bharathidasan University, Tiruchirapalli under standard environmental conditions (12 h light/dark cycles at 25–28 C, 60–80% relative humidity). They were fed with a standard diet (Hindustan Lever, India) and water ad libitum and allowed to acclimatize for 14 days before the procedure. All studies were conducted in accordance with the National Institute of Health guide (1985).

The bark of *Helicteres isora* L. was collected from Solakkadu, Kollimalai, Namakkal District, Tamilnadu, India and authenticated by Fr. K.M. Matthew, Director, Rapinat Herbarium, St. Joseph’s College, Tiruchirapalli. Voucher Herbarium specimens have been deposited in the (collection number 23644, 27406) Herbarium for future references.

The dried bark of *Helicteres isora* L. was ground into fine powder with auto-mix blender. Then the fine powder was suspended in equal amount of water and stirred intermittently and left overnight. The macerated pulp was then filtered through a coarse sieve and the filtrate was dried at reduced temperature. This dry mass (yield 185g/kg of powdered bark) served as aqueous extract of *Helicteres isora* for experimentation

Streptozotocin, purchased from Sigma Chemical Co. (Saint Louis, MO, USA) was dissolved in 0.1M ice-cold citrate buffer, pH 4.5, immediately before use. Six rats per group were administered streptozotocin (60 mg/kg) by subcutaneous injection. After 48 h, fasting blood glucose levels as well as glycosuria were assessed to confirm the diabetic state. Only rats with a fasting blood glucose level of at least 250 mg/dl and positive urine glucose were considered diabetic and used in the experiment.

Male Wistar albino rats weighing 180–250 g were used. The animals were randomly divided into six groups of six animals each.

- **Group 1**: Normal control rats.
- **Group 2**: Diabetic control rats.
- **Group 3**: Diabetic rats administered three units of insulin by subcutaneous injections.
- **Group 4 & 5**: Diabetic rats given bark extracts at the dose of 100, 200 mg/kg respectively.
- **Group 6**: Diabetic rats given reference drug (tolbutamide) at the dose of 250 mg/kg.

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