Royal jelly and propolis prevent development of insulin resistance in type 2 diabetic animal models.

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Honeybee products such as royal jelly (RJ) and propolis (PPL) are known to contain excellent nutrition and have a variety of biological activities. The present study was designed to investigate the effects of RJ and PPL on insulin resistance (hyperinsulinemia) in fructose-drinking rats (FDR; insulin resistance and type 2 diabetic animal model) and Otsuka Long-Evans Tokushima Fatty (OLETF; type 2 diabetic animal model) rats. Male Wistar rats (6 week-old) received 15% fructose solution in drinking water for 8 weeks. FDR showed significant increases in plasma levels of insulin and triglyceride, Homeostasis Model Assessment ratio (HOMA-R, an index of insulin resistance), and systolic blood pressure, but not blood glucose levels, when compared with control rats. RJ (100 and 300 mg/kg/day, p.o.) or PPL (Brazilian propolis extract; 100 and 300 mg/kg/day, p.o.) treatment for 8 weeks significantly decreased the plasma levels of insulin and triglyceride, HOMA-R, without affecting blood glucose or total cholesterol levels and tended to lower systolic blood pressure. In another insulin resistance model OLETF rats, RJ (30 and 300 mg/kg/day, p.o.) or PPL (100 and 300 mg/kg/day, p.o.) treatment for 4 weeks tended to decrease systolic blood pressure and significantly decreased serum level of insulin and HOMA-R. These results suggest that RJ and PPL could be an effective functional food to prevent insulin resistance associated with the development of hypertension.