

Radical Scavenging Activity of Bee Pollen May Help Prevent Cancer, Diabetes

Chemical Composition, Botanical Evaluation and Screening of Radical Scavenging Activity of Collected Pollen by the Stingless Bees *Melipona rufiventris* (Uruçu-amarela)
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Stingless bees in Brazil are indigenous and found all over the country. Bee pollen is used for its nutritional value in the human diet. It is made up of natural flower pollen mixed with nectar and bee secretions. In order to evaluate the chemical composition, free radical scavenging activity, and botanical origin, sample of pollen loads from stingless bee, *Melipona rufiventris* (Uruçu amarela) was studied.

The EtOAc extract of pollen of *Melipona rufiventris* yielded the following compounds: p-hydroxycinnamic acid, dihydroquercetin, isorhamnetin, isorhamnetin-3-O-(6'-O-E-p-coumaroyl)-beta-D-glucopyranoside, luteolin, and quercetin. This is the first report of the isolation of isorhamnetin-3-O-(6'-O-E-p-coumaroyl)-beta-D-glucopyranoside from pollen.

The free radical scavenging activities of different solvent extracts of pollen were determined using DPPH assay. This activity decreases in the order: EtOAc>EtOH>Hexane extract. It appears that the EtOAc extract of the pollen is a good scavenger of active oxygen species. The botanical evaluation of pollen loads showed the composition by two pollen types, with the dominant type (97.3%) being *Scopariadulcis* (L.) (Scrophulariaceae) and the minor one *Senna obtusifolia* (L.) Irwin & Barneby (Fabaceae). This suggests a specific foraging behavior in *Melipona rufiventris* bees, even in an environment with such a rich botanical diversity as the Northeastern Brazil...

Conclusion

In pollen loads of *Melipona rufiventris* the EtOAc mainly comprised of p-hydroxycinnamic acid, dihydroquercetin, isorhamnetin, isorhamnetin isorhamnetin-3-O-(6''O-E-p-coumaroyl)-â-D-glucopyranoside, luteolin, and quercetin.

To the best of our knowledge, this is the first report of the isolation of isorhamnetin isorhamnetin3O(6''OEpcoumaroyl) âDglucopyranoside from pollen. The botanical evaluation of bee pollen showed that it was composed by two pollen types, with the dominant type (97.3%) being *Scoparia dulcis* and the isolated one, *Senna obtusifolia*. This result suggests a specific foraging behavior in *Melipona rufiventris* bees, even in an environment as rich in diversity as the Northeastern Brazilian flora.

The free radical scavenging effectiveness of the extracts showed that EtOAc extract was the most active. This is the first study of pollen loads from stingless bee *Melipona rufiventris*, a native species of Northeastern Brazil.

The results of these trials will be helpful for the commercial production of the stingless bee pollen for pharmaceutical or nutritional use. Other bioactivity determinations are now being carried out in order to give us more information about the potentiality of these pollens.

It suggests that the extracts of the pollen are good scavengers of active oxygen species. This property of pollen seems to be important in the prevention of various diseases such as cancer, cardiovascular diseases, and diabetes, among others.

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