Effects of Known Endocrine Disruptor Pyriproxyfen Compared to Suspected Endocrine Disruptors Bisphenol-A (BPA) and Bisphenol-S (BPS) on Blaptica dubia Roaches

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Our physical world consists of chemicals; many are safe, but some are harmful. Chemicals that we ingest need to be closely monitored. Bisphenol-A (BPA) is used in plastics and has been investigated for toxicity because it leaches into food and drink. This experiment tested the effects of Bisphenol-A (BPA), Bisphenol-S (BPS), and Pyriproxyfen on growth, food intake, and mortality of juvenile roaches (Blaptica dubia) over two weeks, and the reproduction of adults. The null hypotheses were that BPA, BPS and Pyriproxyfen would have no effect on their growth, food intake, mortality and reproduction. The masses of the roaches were measured before and after treatments along with their food intake, mortality and reproduction. The null hypotheses for juvenile roaches were rejected for mortality and food intake ($p < 0.05$), but the data analysis failed to reject the null hypothesis for growth, although there was a strong trend ($p=0.091$). The BPA had the same mortality rate as the Pyriproxyfen. The BPS follows closely with the known endocrine disruptor Pyriproxyfen for food intake and growth. The null hypotheses were also rejected for the adults. More males died than females. Pyriproxyfen, BPA and BPS caused mortality and decreased fecundity compared to the control. This leads to a conclusion that while BPS might not be as toxic as BPA, it could be an endocrine disruptor. More research should be done on BPA and BPS to determine their effects on human health.

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