**Determining the NOEC of reproduction count data: Comparison of results obtained by application of the new CPCAT approach to results obtained using the well known t-tests of Dunnett and Williams**

René Lehmann1, Jean Bachmann1, Bilgin Karaoglan1, Jens Lacker1

1 Federal Environment Agency, Department of Chemical Safety, Wörlitzer Platz 1, 06844 Dessau-Roßlau,

rene.lehmann@uba.de

Because species reproduction determines population dynamics it is a key parameter in ecotoxicological risk assessment (OECD 1984, 2004, 2012). Recently, the CPCAT (closure principle computational approach test) has been proposed to evaluate reproduction count data (Lehmann 2014). It focuses on the determination of a NOEC/LOEC (no/lowest observed effect concentration) and clearly points out that the well known t-tests of Dunnett and Williams (Dunnett 1955, 1964, Williams 1971, 1972) must not be applied because variance homogeneity is not plausible for reproduction count data. From a regulatory point of view, it is of great interest to explore whether CPCAT yields similar or completely different NOECs than Dunnett and Williams t-tests. To investigate this issue, numerous real data sets have been evaluated applying CPCAT and the t-tests mentioned above, respectively. Overall, we investigated 77 real reproduction count data sets for 7 test systems. Reproductive numbers of the species investigated were of different orders of magnitude. Data sets provided consist of small reproductive numbers (<100), morderate reproductive numbers (<2000), and large reproductive numbers (>>2000). For 17 data sets a monotone dose-response relation could not be observed, i.e. Williams t-test was not applicable. From the results we conclude that CPCAT-NOECs are generally smaller (in about 67% of the cases) or equal (30%) to NOEC values obtainined using Dunnett t-tests.Compared to Williams t-test CPCAT-NOECs deceed (22%), equal (48%) or exceed (30%) the Williams-NOECs. We observed this relation throughout all species and reproductive numbers. Focussing only on data sets showing no clear dose-response relation the importance of CPCAT is clearly pointed. Here, in 71% of the cases CPCAT provided a NOEC smaller than Dunnett t-test. Regarding the fact that the statistical assumption of variance homogeneity cannot be fulfilled for reproduction count data Dunnett and Williams t-tests should not be applied in the future. CPCAT has proven a practical tool yielding reliable statistical results and NOECs. Overall, concerning the order of magnitude of NOECs CPCAT seems superior to Dunnett t-test and equal to Williams t-tests.

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