Congener group profiles of the dust samples were also assessed in the different microenvironments based on the carbon chain length and chlorine atom substitution (Fig. 2).The abundance of C_{14} and C_{15} groups in the different microenvironments were very stable with no significant differences among different types of rooms. For example, the median contributions of C_{14} group were 43%, 42%, and 41% of ∑CPs in houses, offices and vehicles, respectively. The chlorine content in different microenvironments were also similar, with medians of 52 %, 50 % and 52 % in houses, offices, and vehicles, respectively. However, we found a significant (P=0.036) difference between the carbon chain length based profile of LCCPs, where C_{18} group contributed 64% of the total LCCPs in dust that collected from houses, while C_{18} group only contributed 44 % for dust collected from offices. These findings suggested that LCCPs might have different sources in different microenvironments, while the sources of SCCPs and MCCPs might be similar.

Human exposure assessment to CPs

Using the median concentrations of CPs in the dust samples, human exposure to CPs via dust, both via ingestion and dermal exposure, was estimated. The medians of estimated daily intake of ∑CPs for Australian adults and toddlers were 80 and 620 ng/kg/day, respectively. These results were lower than intakes in China (150 ng/kg/day for adults) [23], but higher than intakes in Sweden (∑CPs, 2.5 ng/kg/day for adults and 240 ng/kg/day for toddlers) [17]. The ∑CPs intake through dust was comparable to the dietary intake (100-370 ng/kg/day) estimated in Japan [24], suggesting that dust ingestion and dermal contact with dust from indoor environment may be an important exposure pathway for CPs in Australia. The reference doses (RfDs) for SCCPs, MCCPs, and LCCPs, based on neoplastic effects, are 10, 100 and 100 µg/kg/day, respectively as recommended by the International Programme on Chemical Safety [25]. The daily intake of CPs for Australian residents were, in the worst-case scenario (95th percentile concentrations of CPs were used), 2-3 orders of magnitudes lower than the RfDs. However, further research is required to improve the understanding on the safety based reference doses to human.

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