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- **Palladium (Pd)** is used in catalysis and found in air, soil, and water
- **Ecotoxicity Data:** Limited data on algae, invertebrates, fish
- **Alternative Assessment Approaches** to facilitate ecotoxicological assessment

METHODS

STUDY OBJECTIVES

- **Literature Review** (Klimisch score 1-2) and OECD/GLP compliant study reports from industry
- Collection of **acute & chronic effective concentrations (EC50, EC10) of alga, invertebrates, and fish**
- Identify outliers unsuitable for read-across
- **Analyze Pd respeciation** (freshwater) & establish grouping

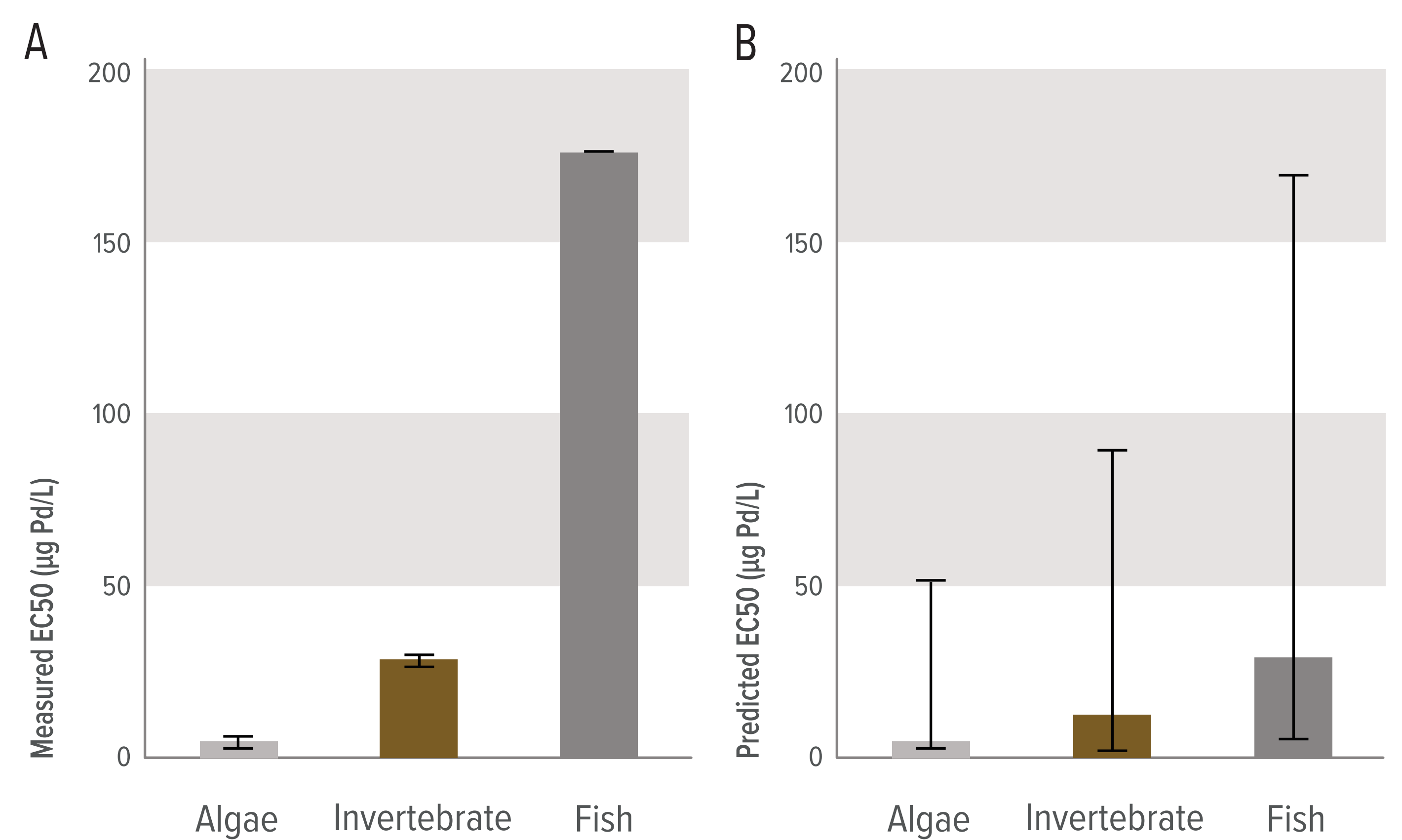


Fig. 2: Comparison of experimentally measured EC50 values (A) and QICAR modelled values (B) across three trophic levels for the grouped Pd compounds.

- simple inorganic Pd salts (e.g. Pd dichloride, Pd dihydroxide or Pd sulphate)
- tetraamminepalladium compounds
- tetra- and hexachloropalladium compounds
- mixed ammine/chloride salts (diamminedichloropalladium)

- 1. Toxicity Variations:**
 - Algae most sensitive species
 - Outlier:
 - Palladium (II) di(4-oxopent-2-en-2-oate) & Palladium dinitrate (Fig. 1)
 - Palladium dinitrate (chronic; not shown)
- 2. Toxicity Variations:**
 - Prediction matches with measured values for algae and invertebrate, but conservative for fish (Fig. 2)

- **Grouped substances** (inorganic Pd-salts): Respeciation in water to common Pd(OH)₂ species
- **Palladium dinitrate**: hydrolyzes to complexes with lower bioavailability & toxicity than grouped substances
- **Palladium (II) di(4-oxopent-2-en-2-oate)**: limited respeciation; unique toxicity profile due to lipophilic mechanism
- **Palladium (II) Acetate**: speciation unclear, but comparable toxicity than grouped substances