

## **Supporting Information**

### **Organohalide-respiring bacteria in polluted urban rivers employ novel bifunctional reductive dehalogenases to dechlorinate polychlorinated biphenyls and tetrachloroethene**

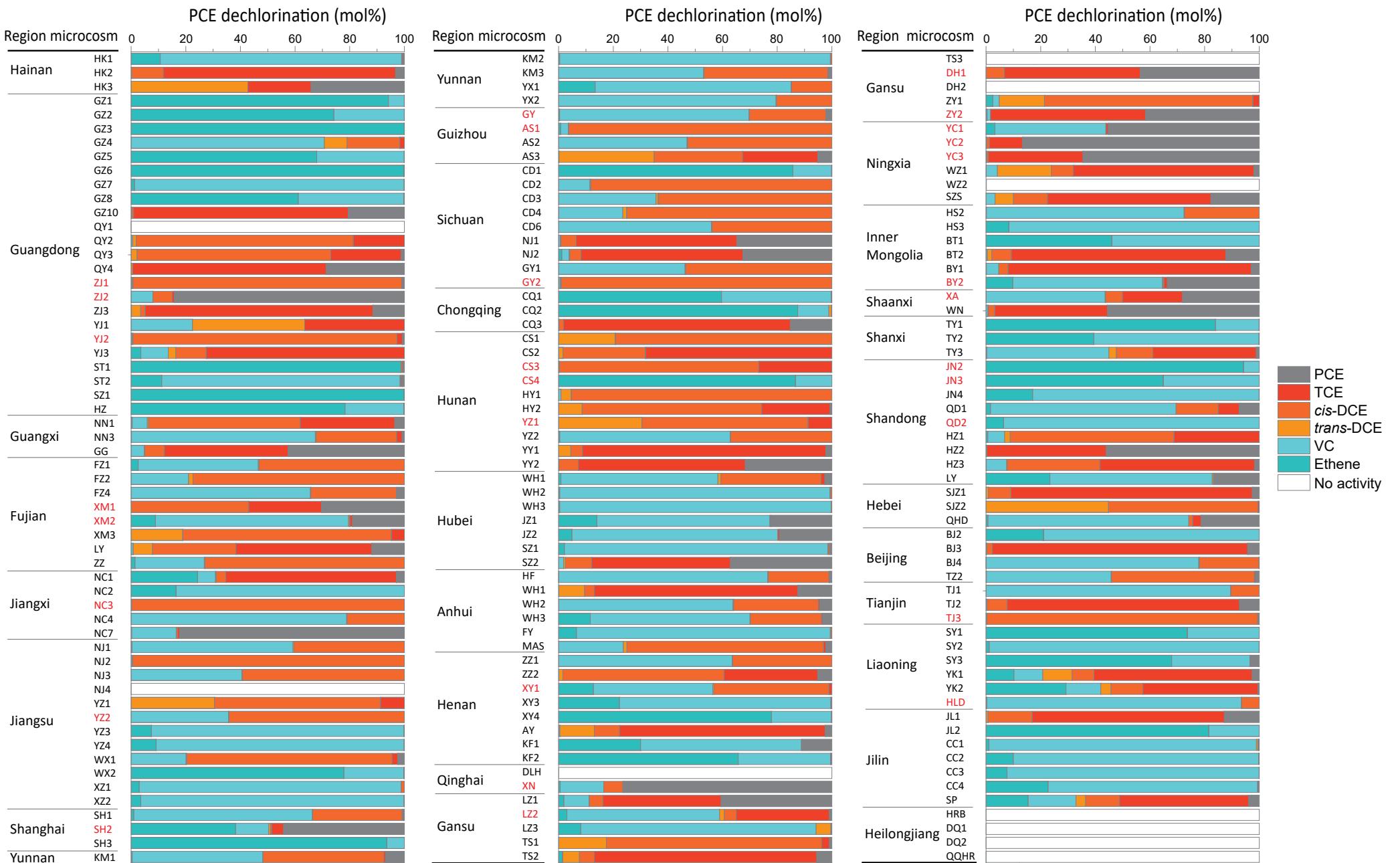
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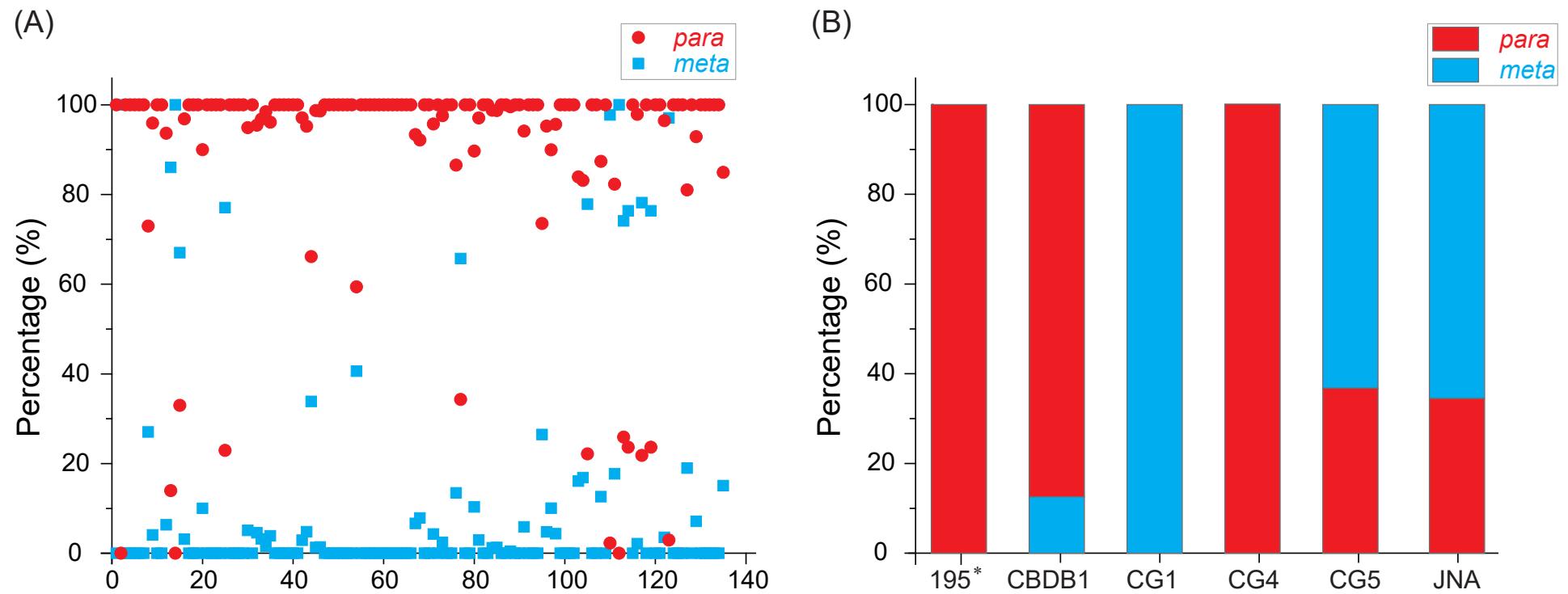
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The supplementary information include 4 supplementary figures and 5 supplementary tables.

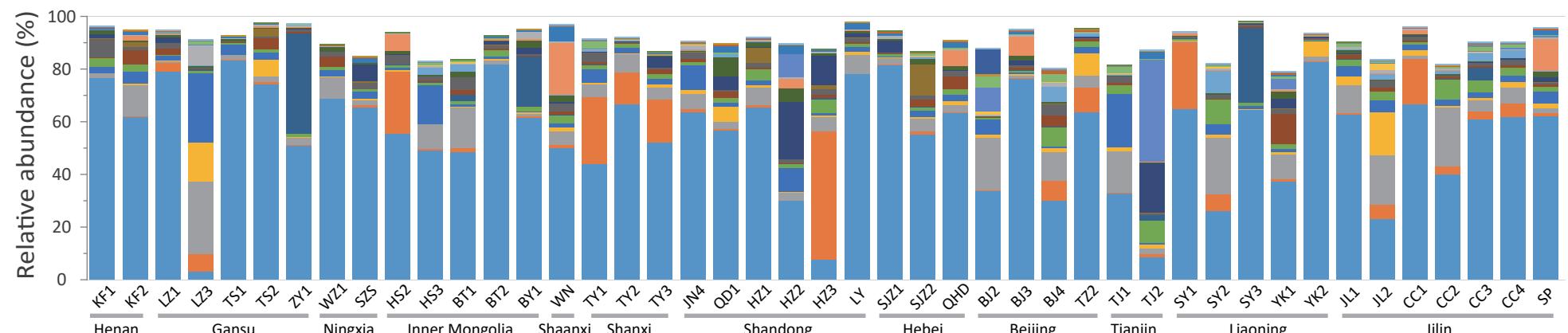
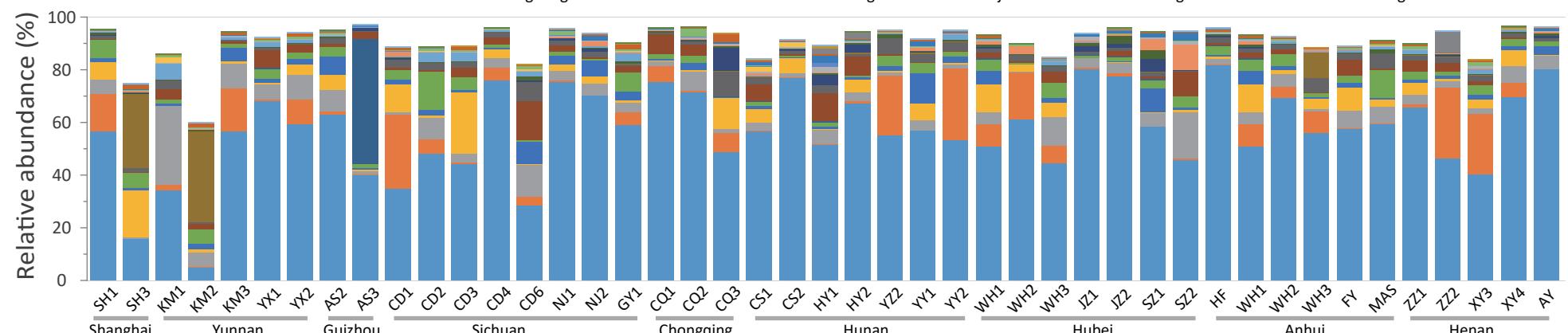
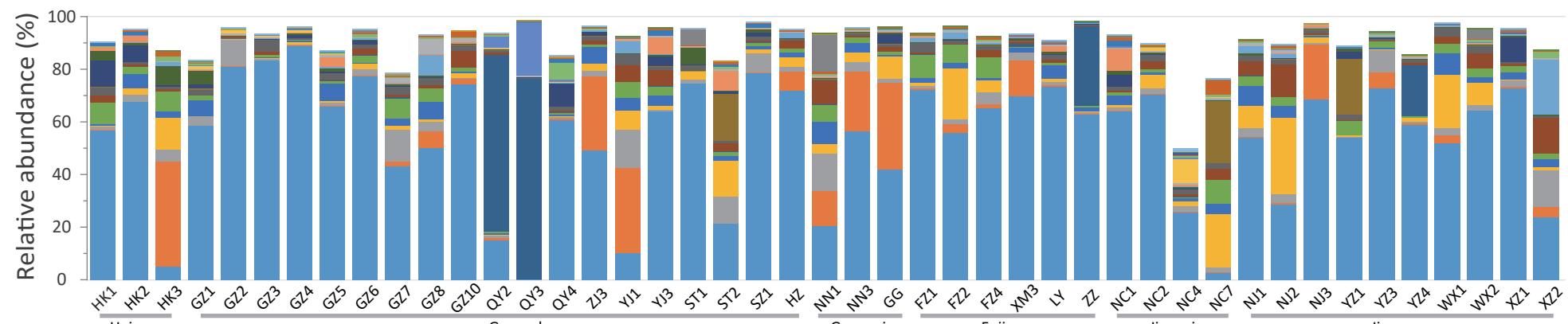


**Figure S1.** PCE dechlorination in the 174 microcosms. Blank boxes represent no detection of PCE dechlorination activity after three months of incubation. Samples in red font represent no PCB180 dechlorination activity.

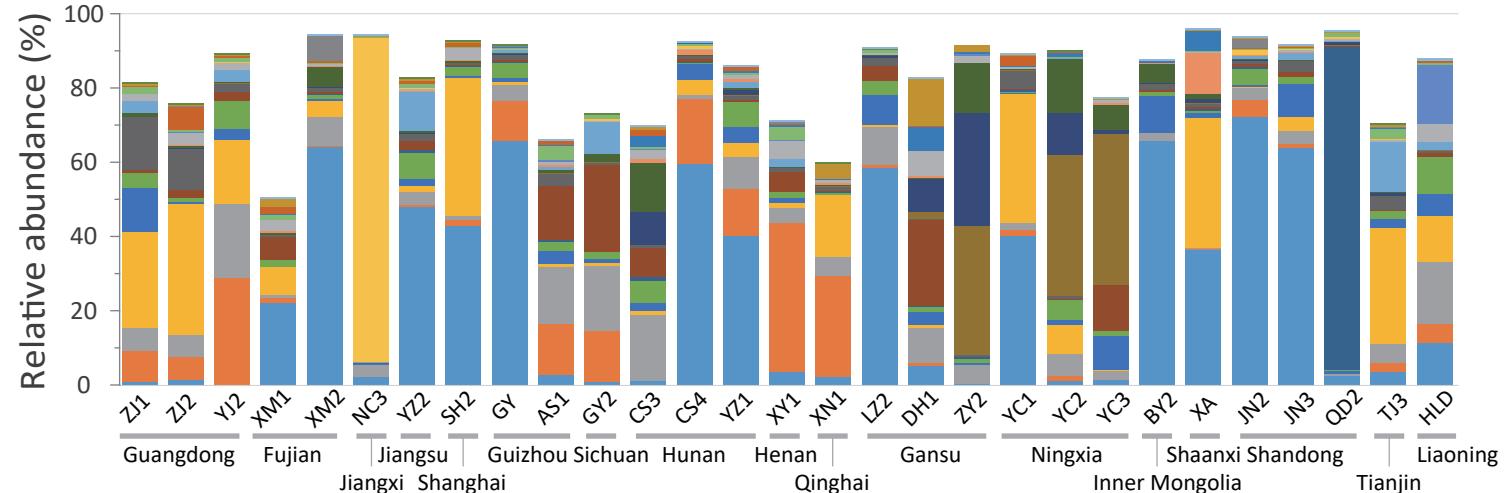


**Figure S2.** Preference of *meta*- and *para*-chlorines in reductive dechlorination of PCB180 in the 135 PCB/PCE-dechlorinating sediment-free cultures (A) and characterized *Dehalococcoides mccartyi* strains (B). \* A mixed culture containing *D. mccartyi* 195.

(A)

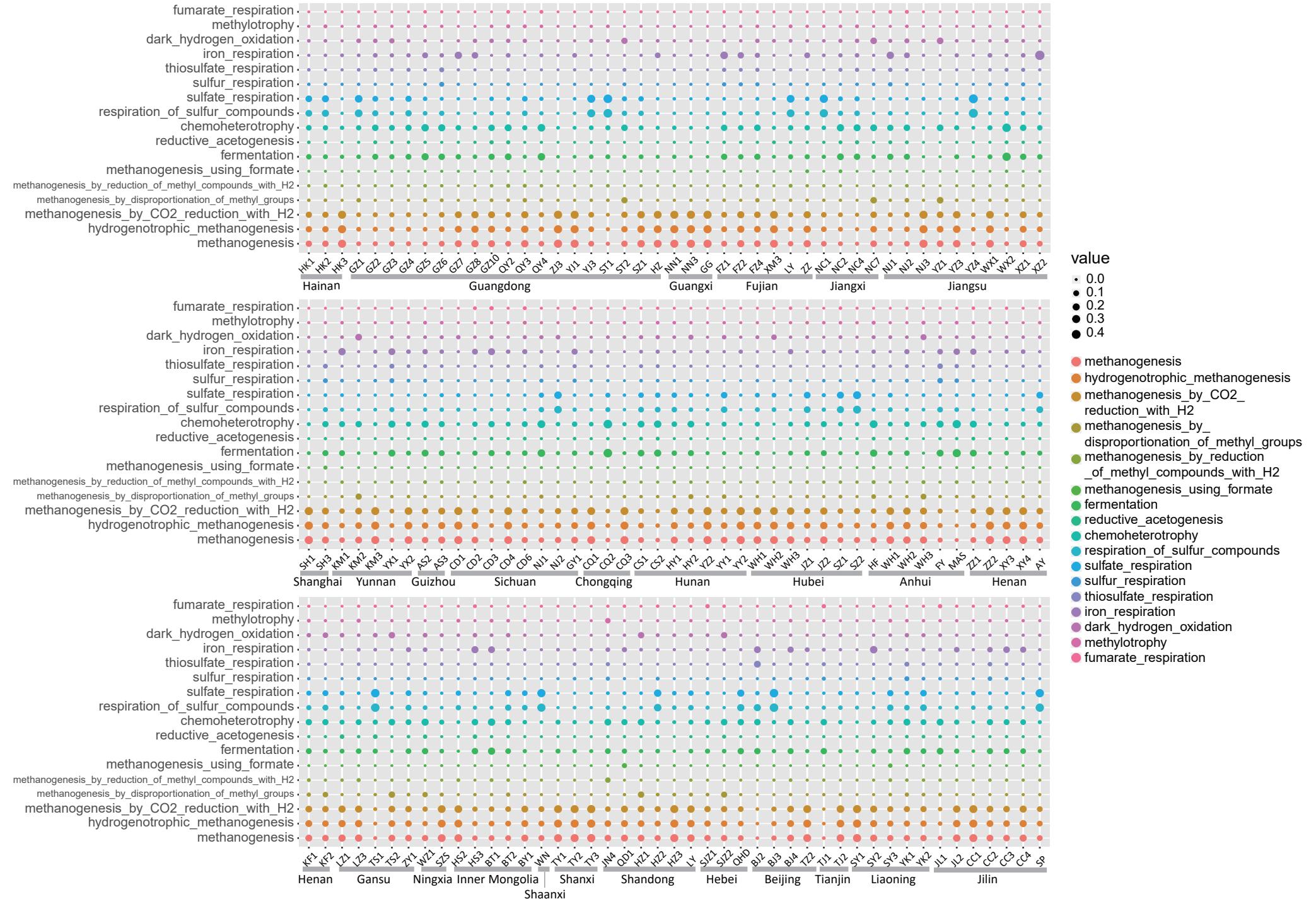


(B)



- [Color Box] Bacteria, Cloacimonetes, Cloacimonadia, Cloacimonadales, Cloacimonadaceae, LNR A2-18
- [Color Box] Bacteria, Firmicutes, Clostridia, Clostridiales, Peptococcaceae, Cryptanaerobacter
- [Color Box] Archaea, Euryarchaeota, Methanomicrobia, Methanosarcinales, Methanosarcinaceae, Methanosarcina
- [Color Box] Bacteria, Spirochaetes, Spirochaetia, Spirochaetales, Spirochaetaceae, uncultured
- [Color Box] Bacteria, Cloacimonetes, Cloacimonadia, Cloacimonadales, SHA-4, uncultured bacterium
- [Color Box] Bacteria, Firmicutes, Negativicutes, Selenomonadales, Veillonellaceae, uncultured
- [Color Box] Bacteria, Bacteroidetes, Bacteroidia, Bacteroidales, Rikenellaceae, uncultured
- [Color Box] Bacteria, Bacteroidetes, Bacteroidia, Sphingobacteriales, Lentimicrobiaceae, Lentimicrobium
- [Color Box] Bacteria, Firmicutes, Clostridia, Clostridiales, Clostridiaceae 1, Clostridium sensu stricto 7
- [Color Box] Bacteria, Spirochaetes, Spirochaetia, Spirochaetales, Spirochaetaceae, Sphaerochaeta
- [Color Box] Archaea, Euryarchaeota, Methanomicrobia, Methanomicrobiales, Methanomicrobiaceae, Methanoculleus
- [Color Box] Bacteria, Firmicutes, Clostridia, Clostridiales, Family XI, Sedimentibacter
- [Color Box] Bacteria, Chloroflexi, Dehalococcoidia, Dehalococcoidales, Dehalococcoidaceae, Dehalogenimonas
- [Color Box] Bacteria, Firmicutes, Negativicutes, Selenomonadales, Veillonellaceae, uncultured bacterium
- [Color Box] Bacteria, Bacteroidetes, Bacteroidia, Bacteroidales, Dysgonomonadaceae, Petrimonas
- [Color Box] Bacteria, Proteobacteria, Deltaproteobacteria, Syntrophobacterales, Syntrophobacter
- [Color Box] Bacteria, Proteobacteria, Deltaproteobacteria, Desulfuromonadales, Geobacteraceae, Geobacter

**Figure S3.** Microbial community composition of (A) 135 PCB/PCE-dechlorinating microcosms and (B) 29 PCE-dechlorinating microcosms without PCB dechlorination activity. Top 20 most abundant genus and known OHRBs (average relative abundance > 0.01%) were included in the figure.



**Figure S4.** Predicted microbial community function of the 135 PCB/PCE-dechlorinating microcosms.