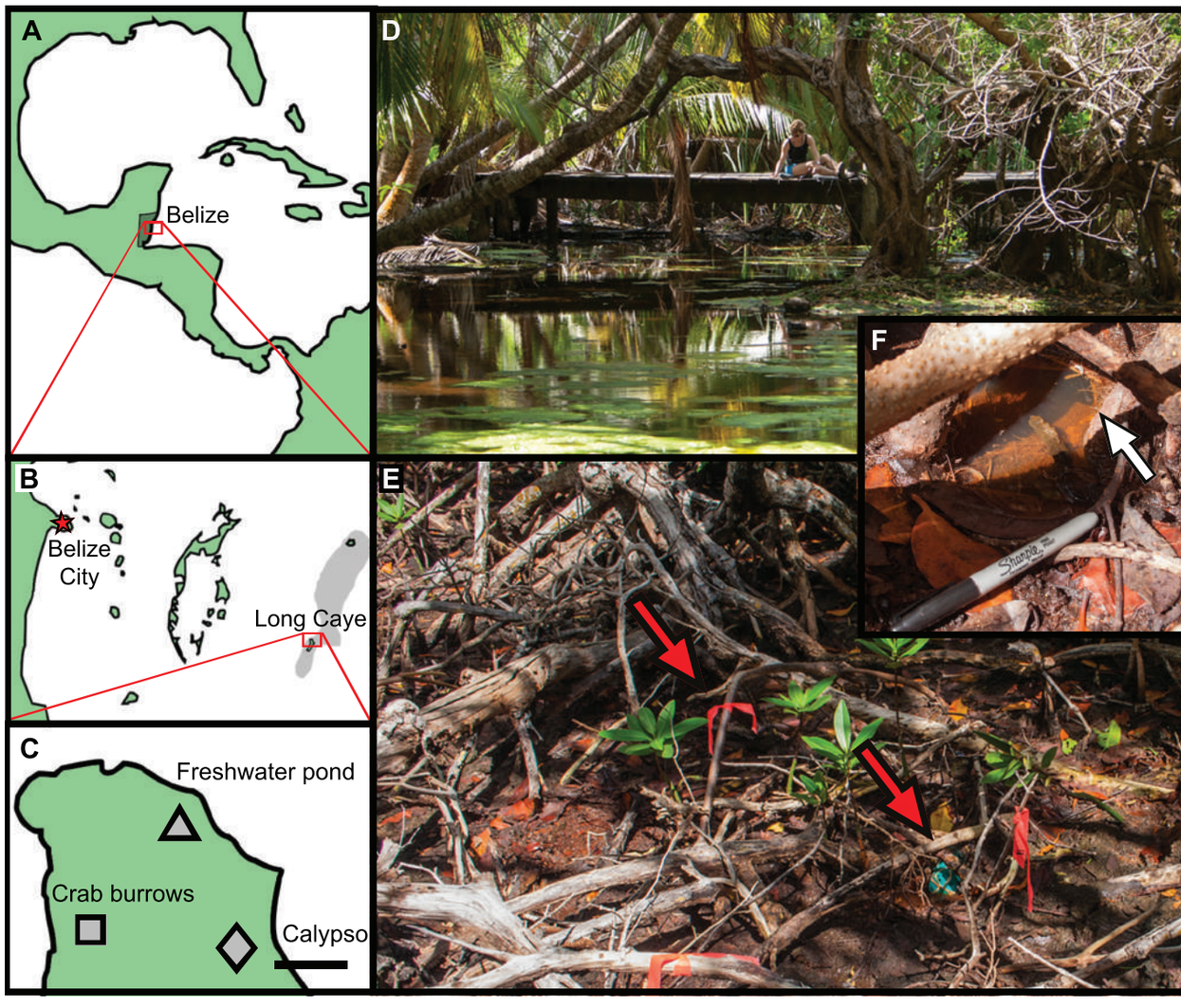

Fig. S1. Collection locations of *Kryptolebias marmoratus* on Long Caye, Belize. (A) Map of Central America, showing the location of Belize and the inset map (B) of the central Belize barrier reef including Long Caye, Lighthouse Reef Atoll to the east. (C) Close view of the northern tip of Long Caye showing the Calypso (diamond symbol), freshwater pond (triangle), and crab burrow (square) sampling locations. Scale bar = 200 m, north is up. (D) Photograph of the freshwater pond site. (E) Photograph of the crab burrow collection site. Crab burrows are marked in the photograph with flagging tape and overlaid red arrows. (F) Inset photo of a singular crab burrow occupied by a mangrove rivulus (white arrow). The permanent marker included for scale = 13.5 cm.

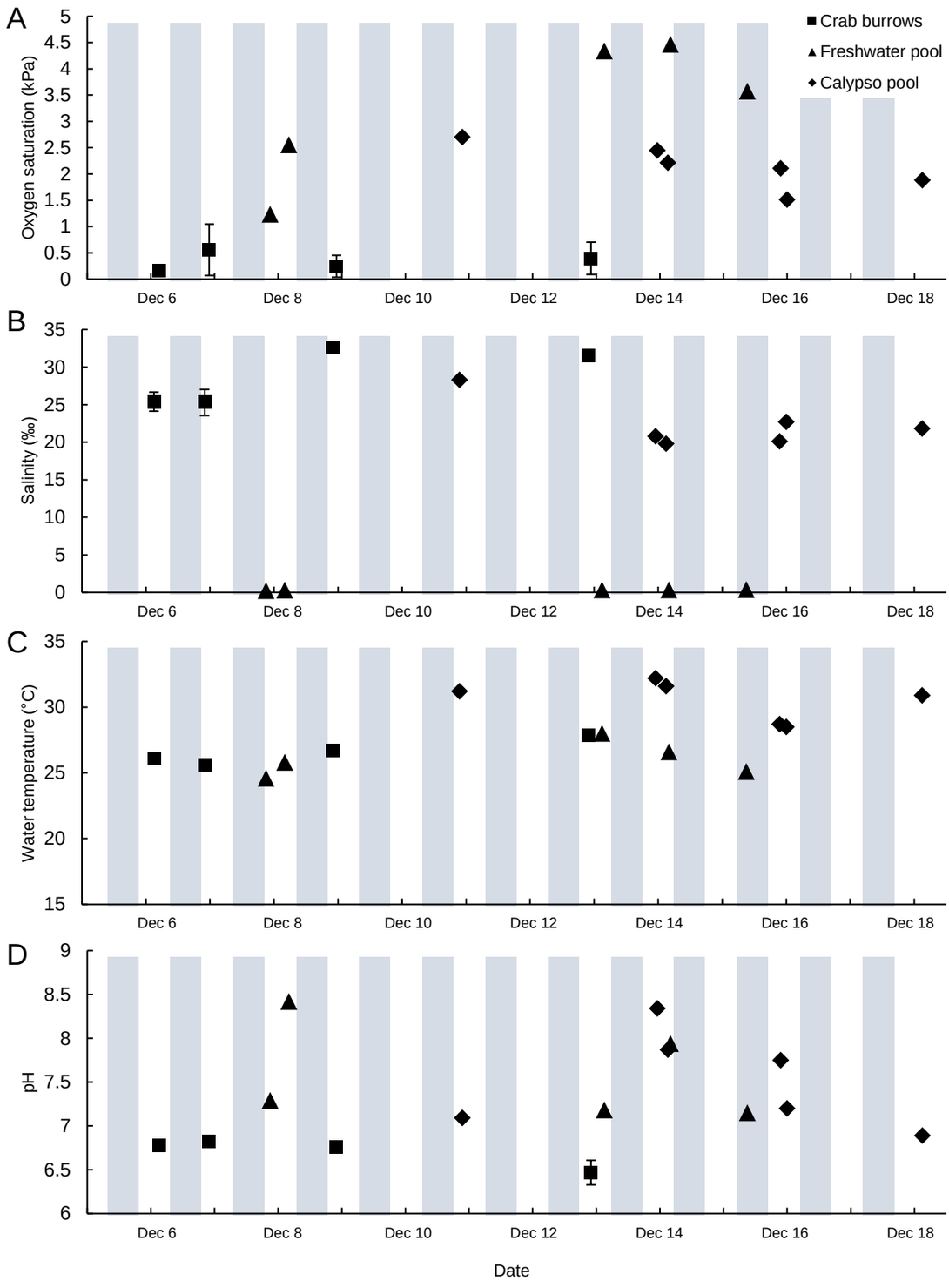

Fig. S2. Water conditions over time at *Kryptolebias marmoratus* collection locations on Long Caye, Belize in December 2012. (A) partial pressure of O_2, (B) salinity, (C) water temperature, (D) pH of each habitat. White vertical bars represent daylight, grey vertical bars represent night. Tick-marks on the x-axis denote noon of each day. Fish from crab burrows are represented with square symbols, from the freshwater pool with triangles, and from Calypso with diamonds. Measurements of the freshwater and Calypso pools were taken from the same single location at each sampling time. Crab burrow values are means ± SEM of the same 18 burrows measured during each sampling period.

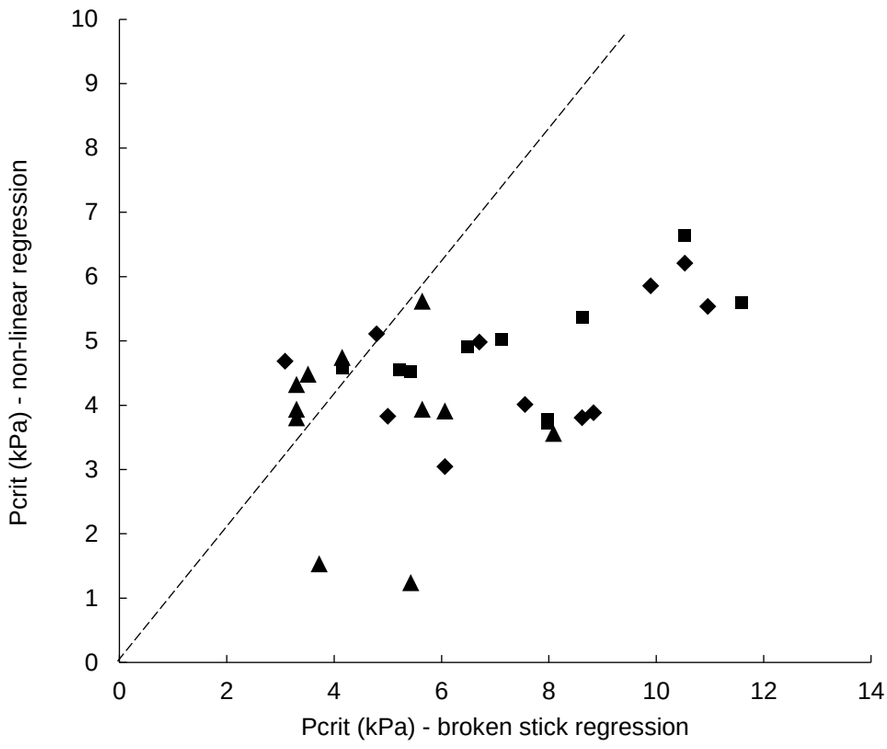

Fig. S3. There was a significant relationship between calculations of P_{crit} using broken stick regression and non-linear regression (R^2= 0.21, *P*<0.01). Fish from crab burrows are represented with square symbols, from the freshwater pool with triangles, and from Calypso with diamonds. The dashed diagonal line indicates equivalency.

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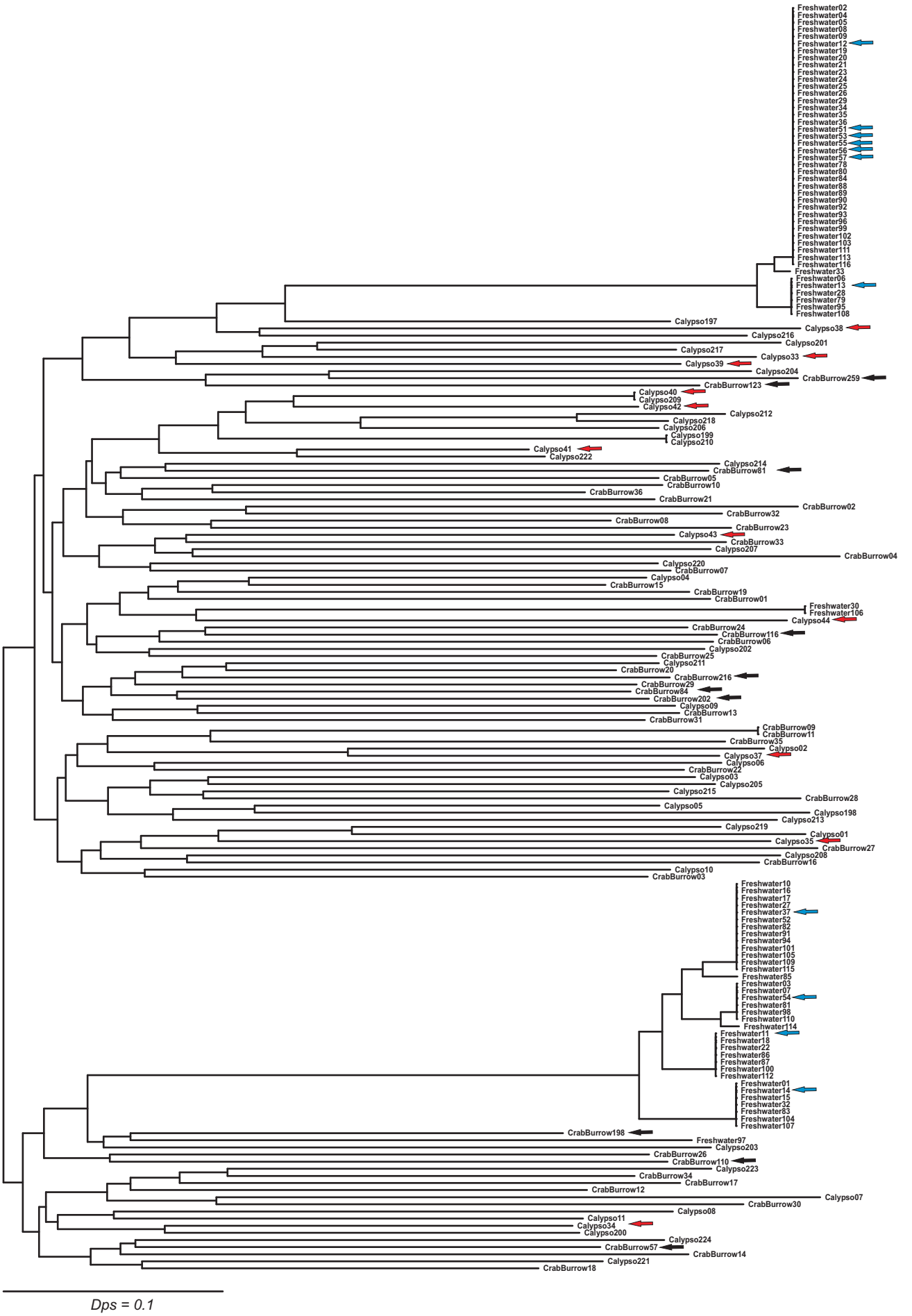
Freshwater02
Freshwater04
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Freshwater26
Freshwater29
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Freshwater103
Freshwater111
Freshwater113
Freshwater116
Freshwater33
Freshwater06
Freshwater13
Freshwater28
Freshwater79
Freshwater95
Freshwater108
Calypso197
Calypso38
Calypso216
Calypso201
Calypso217
Calypso33
Calypso39
Calypso204
CrabBurrow259
CrabBurrow123
Calypso40
Calypso209
Calypso42
Calypso212
Calypso218
Calypso206
Calypso199
Calypso210
Calypso41
Calypso222
Calypso214
CrabBurrow81
CrabBurrow05
CrabBurrow10
CrabBurrow36
CrabBurrow21
CrabBurrow02
CrabBurrow32
CrabBurrow08
CrabBurrow23
Calypso43
CrabBurrow33
Calypso207
CrabBurrow04
Calypso220
CrabBurrow07
Calypso04
CrabBurrow15
CrabBurrow19
CrabBurrow01
Freshwater30
Freshwater106
Calypso44
CrabBurrow24
CrabBurrow116
CrabBurrow06
Calypso202
CrabBurrow25
Calypso211
CrabBurrow20
CrabBurrow216
CrabBurrow29
CrabBurrow84
CrabBurrow202
Calypso09
CrabBurrow13
CrabBurrow31
CrabBurrow09
CrabBurrow11
CrabBurrow35
Calypso02
Calypso37
Calypso06
CrabBurrow22
Calypso03
Calypso205
Calypso215
CrabBurrow28
Calypso05
Calypso198
Calypso213
Calypso219
Calypso01
Calypso35
CrabBurrow27
Calypso208
CrabBurrow16
Calypso10
CrabBurrow03
Freshwater10
Freshwater16
Freshwater17
Freshwater27
Freshwater37
Freshwater52
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Freshwater101
Freshwater105
Freshwater109
Freshwater115
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Freshwater03
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Freshwater86
Freshwater87
Freshwater100
Freshwater112
Freshwater01
Freshwater14
Freshwater15
Freshwater32
Freshwater83
Freshwater104
Freshwater107
CrabBurrow198
Freshwater97
Calypso203
CrabBurrow26
CrabBurrow110
Calypso223
CrabBurrow34
CrabBurrow17
CrabBurrow12
Calypso07
CrabBurrow30
Calypso08
Calypso11
Calypso34
Calypso200
Calypso224
CrabBurrow57
CrabBurrow14
Calypso221
CrabBurrow18
Dps = 0.1

Fig. S4. Neighbour-joining tree showing microsatellite-based genetic similarity of 178 *Kryptolebias marmoratus* collected from three sites on Long Caye, Belize. Arrows point fish used in respiration experiments (n=32 individuals); black for crab burrows, blue for freshwater pond, and red for Calypso pond.