

# Rapid effects of capture and handling on plasma testosterone in the male Rufous-winged Sparrow, *Peucaea carpalis*



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## 1. Introduction

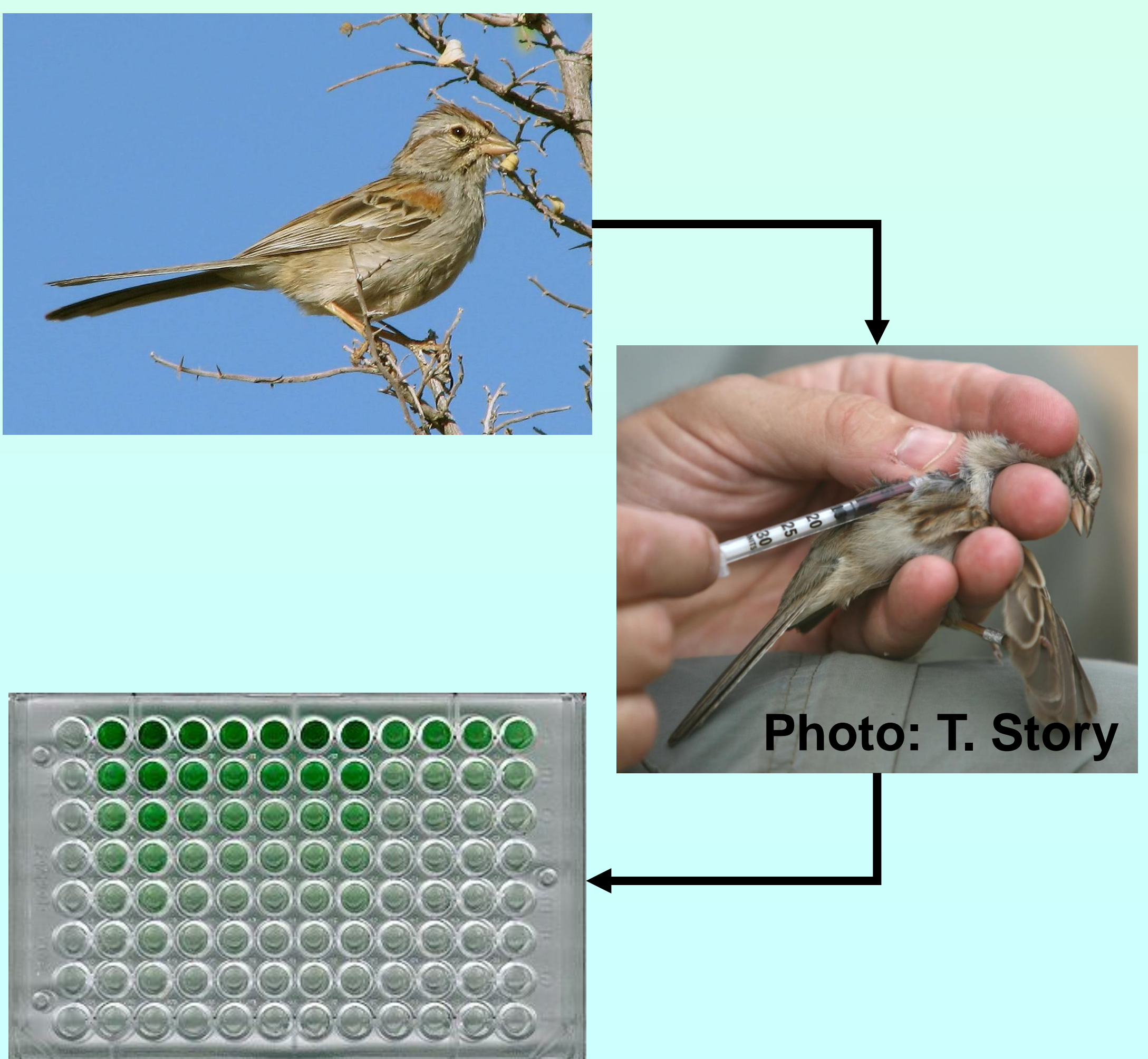
- Many field studies involve the capture and short-term mild restraint of birds.
- These manipulations stimulate the secretion of stress hormones into the blood within minutes, but potential effects on reproductive hormones have not been investigated in any detail.
- Furthermore, there are no data describing how long physiological effects of capture and restraint persist once birds are released.

## 2. Objectives

1. Determine the short-term effect of capture and restraint on the reproductive hormone, testosterone (T) in adult male Rufous-winged Sparrows in breeding condition.
2. Investigate the duration of this effect once birds are released in their home territory.

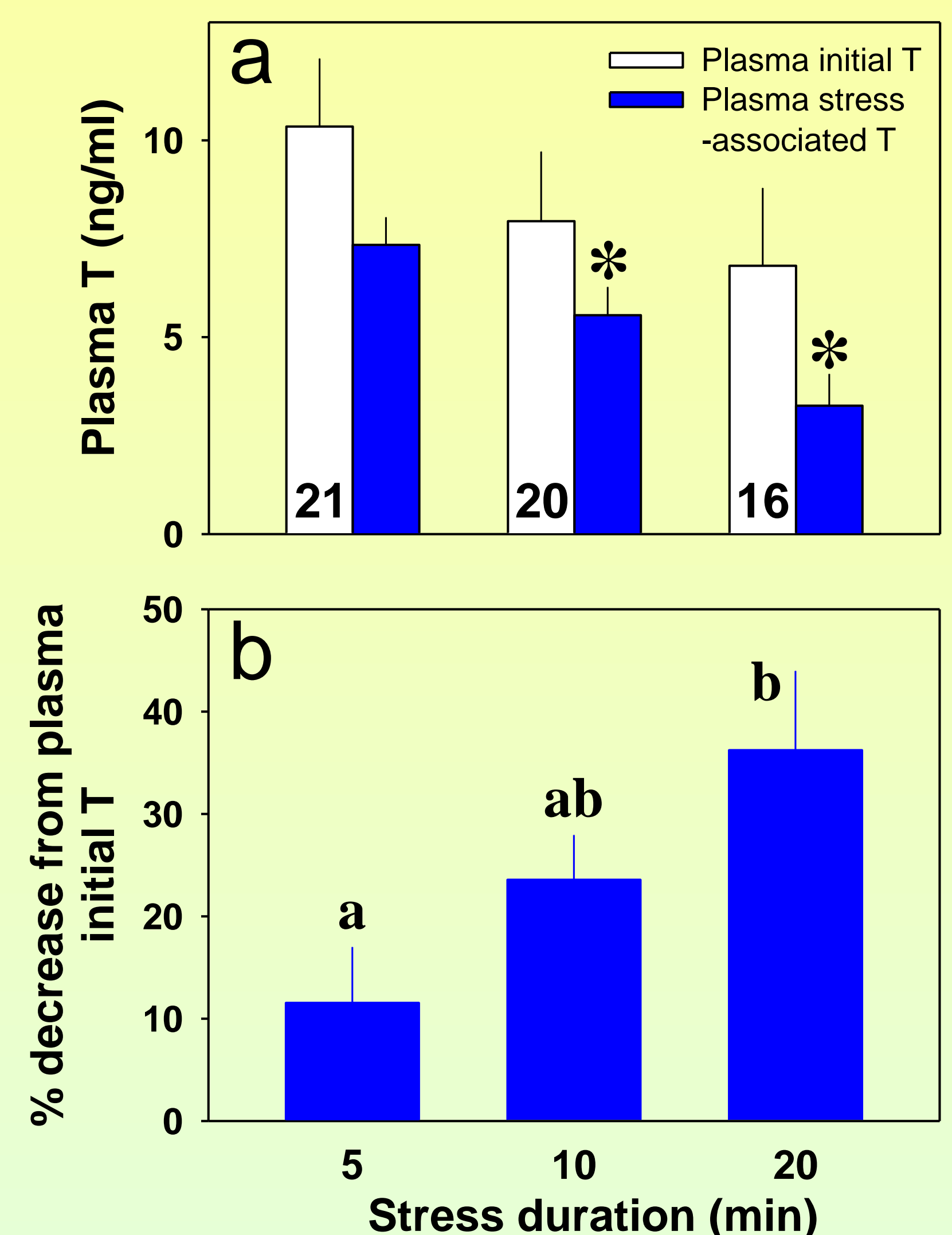
## 3. General methods

- **Species:** adult male Rufous-winged Sparrow.
- **Time:** summer reproductive period (August 2011)
- **Site:** Santa Rita Experimental Ranch, Arizona.
- **Capture:** conspecific song playback recordings and Japanese mist nets.
- **Blood sample collection:** from the jugular vein. **Initial sample** collected within 3 mins of capture; **stress-associated sample** collected after birds are held for specific durations in an opaque breathable cloth bag.
- **Testosterone assay:** specific enzyme-linked immunoassay.



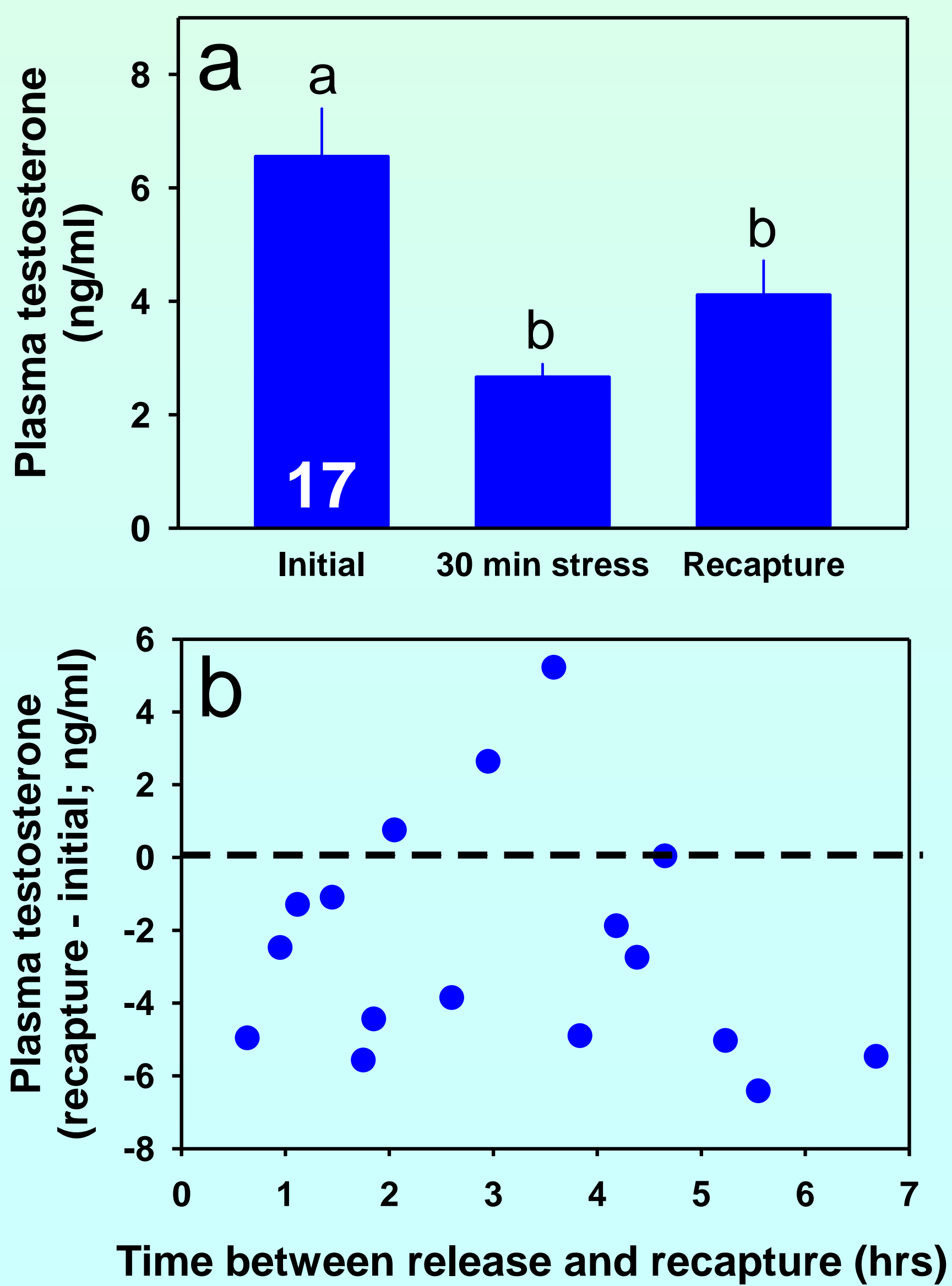
## 4. Results

### Capture and handling decrease plasma T within 10 min of capture



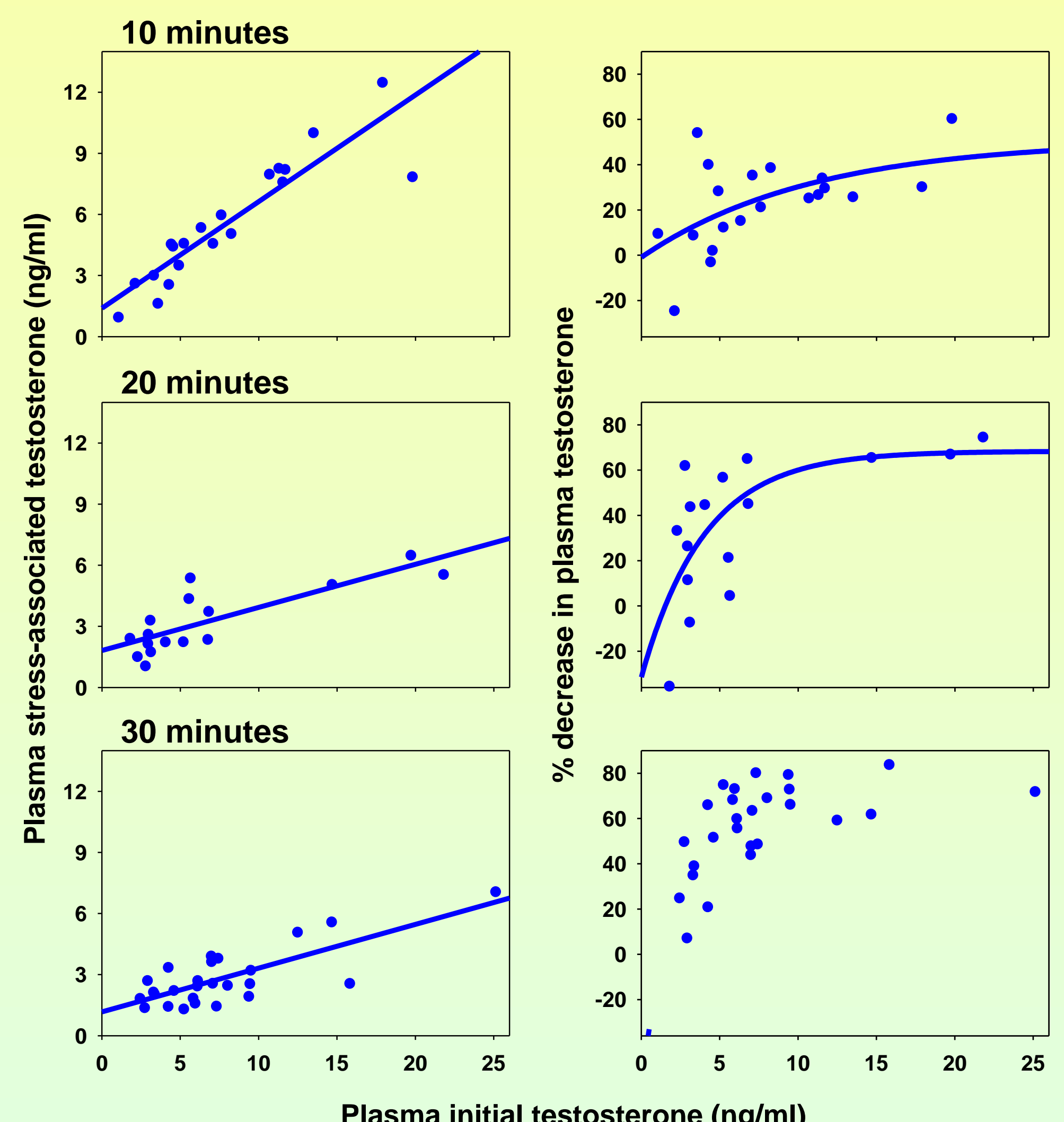
- Plasma T decreases significantly (\*:  $P < 0.05$ ) within 10 min of capture and handling.
- The magnitude of the inhibitory effect on plasma T increases as a function of the capture/handling duration

### Plasma T does not return to initial level for at least seven hours after on-site release



- Plasma T does not differ at the time of release and 1-7 hr later.
- Supporting this conclusion, individual differences between plasma initial and stress-associated T do not decrease as a function of the time after release.

### Plasma capture/handling stress-associated T is related to plasma initial T



- LEFT panels. Plasma stress-associated T is consistently correlated positively with plasma initial T.
- RIGHT panels. The relationship between plasma initial and stress-associated T is, however complex: irrespective of the stress duration, birds with initially high plasma T decrease their plasma T relatively more than birds with initially low plasma T.

## 5. Summary and conclusions

- Birds during field work are often caught and then restrained for brief periods before release at the capture site.
- This results in rapid physiological effects including, in males, a substantial decrease in plasma testosterone within 10 min of capture.
- In addition, the magnitude of the decrease increases as the duration of the restraint increases.
- When released 30 min after capture, birds maintain low plasma testosterone for at least seven hours, indicating that the physiological effect of capture and handling is persistent.
- The mechanism mediating a rapid decrease in plasma T in response to capture/handling stress is not identified. Whether this decrease is associated with behavioral or other changes is also unknown.