

**Plasma haptoglobin concentrations vary by age and region of capture in free-ranging Steller sea lions in Alaska.**

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Haptoglobin (Hp) is an acute phase protein that can be used as a nonspecific indicator of physiological stress. Under normal conditions Hp is either absent from the blood or present at very low levels. Raised levels can be an indicator of acute infection, inflammation or trauma. Plasma samples were collected from 522 free-ranging Steller sea lions in 3 regions of the western DPS (Aleutian Islands n=75, Gulf of Alaska n=45 and Prince William Sound n=166) and in southeast Alaska (eastern DPS n=236) between 1992 and 2008. Plasma concentrations (mg/ml) of Hp were measured spectrophotometrically on a Spectramax 340PC plate reader using Phase Haptoglobin Colorimetric assay kits (10 minute incubation at 30°C) and ranged from undetectable to 8.68 mg/ml. Similar to patterns seen in terrestrial species, plasma Hp concentration was elevated in Steller sea lion neonates sampled during the breeding season, decreased within the first couple of months of life and then showed a progressive increase with age until adulthood in southeast Alaska ( $F_{[10,236]} = 11.17$ ;  $p < 0.0001$ ). Concentrations seen in Aleutian Island animals were lower than expected based on previous studies. Hp concentrations measured in 2 to 12 month old pups in the Aleutian Islands (n=65,  $0.49 \pm 0.06$  mg/ml; mean  $\pm$  SE) and Gulf of Alaska (n=29,  $0.69 \pm 0.10$  mg/ml) were significantly lower than those measured in same age sea lions in Prince William Sound (n=93,  $1.39 \pm 0.08$  mg/ml) and Southeast Alaska (n=90,  $1.63 \pm 0.11$  mg/ml;  $F_{[3,277]} = 39.08$ ,  $p < 0.0001$ ). This could indicate that lower population densities in the western DPS may result in a decrease of disease or parasite prevalence in young animals compared to animals in the increasing eastern stock. There were no significant differences in Hp levels between regions in yearling sea lions (13 to 24 months old,  $1.19 \pm 0.07$  mg/ml;  $F_{[2,157]} = 0.675$ ).

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